November 29, 1974 24

GOVERNMENT REPORTS ANNOUNCEMENTS

CODEN: GVRAA

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

GOVERNMENT REPORTS
ANNOUNCEMENTS

Published every two weeks by the National Technical Information Service (NTIS).
Annual subscription rates:

	Domestic	Canada & Mexico	Foreign
Government Reports Announcements (GRA)	$ 70.00	$ 85.00	$ 95.00
Government Reports Index (GRI)	70.00	85.00	95.00
Combination Package of GRA and GRI	125.00	155.00	175.00

In conjunction with the set prices you may also place an order at the same time for the 1974 Annual Index and receive a 20% discount on that purchase (rate will be established later).

Domestic and foreign air mail charges will be quoted on request. Make remittance payable to NTIS, and mail either to U.S. Department of Commerce Field Office or to NTIS, Springfield, Virginia 22151. Send address changes to NTIS.

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary

NATIONAL TECHNICAL INFORMATION SERVICE
William T. Knox, Director

NATIONAL TECHNICAL
INFORMATION SERVICE

Contents may be printed freely. Mention of source will be appreciated. The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through August 31, 1976.

GOVERNMENT REPORTS ANNOUNCEMENTS

Published every two weeks by the National Technical Information Service (NTIS).
Annual subscription rates:

	Domestic	Canada & Mexico	Foreign
Government Reports Announcements (GRA)	$ 70.00	$ 85.00	$ 95.00
Government Reports Index (GRI)	70.00	85.00	95.00
Combination Package of GRA and GRI	125.00	155.00	175.00

In conjunction with the set prices you may also place an order at the same time for the 1974 Annual Index and receive a 20% discount on that purchase (rate will be established later).

Domestic and foreign air mail charges will be quoted on request. Make remittance payable to NTIS, and mail either to U.S. Department of Commerce Field Office or to NTIS, Springfield, Virginia 22151. Send address changes to NTIS.

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary

NATIONAL TECHNICAL INFORMATION SERVICE
William T. Knox, Director

NATIONAL TECHNICAL INFORMATION SERVICE

Contents may be printed freely. Mention of source will be appreciated. The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through August 31, 1976.

Price Change

Effective November 1, 1974, NTIS adopted a single price schedule for its printed reports, replacing the current schedule which prices reports in stock separately from those which must be reproduced on demand. About 25% of the documents in the NTIS collection will be reduced in price because of this change, while other prices will be increased. There no longer will be a premium charge for custom reproduction from microfiche because of the increasing production from NTIS's microenlarging printers, a breakthrough in the state-of-the-art.

The new prices will be effective for reports now in the collection and those acquired in the future. Some reports will continue to be specially priced, apart from the new schedule which is based on page count. These relatively few exceptions will be the products of special technology groups and organizations for which NTIS is a sales agent and constrained to keep previously established prices.

GOVERNMENT REPORTS ANNOUNCEMENTS

Volume 74, Number 24 ◆◆◆ November 29, 1974

CONTENTS

INTRODUCTION III

SUBJECT FIELD & GROUP STRUCTURE IV

REPORTS AND TRANSLATIONS 1

REPORT LOCATOR LIST A-1

INDEXES. Corporate Author, Subject, Personal Author, Contract Number, and Accession/Report Number Indexes are published in the corresponding issue of Government Reports Index (GRI).

NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)
KEY TELEPHONE NUMBERS

Business hours: Monday through Friday, 7:45 a.m. to 4:15 p.m.

General Information .....(Area Code 703)	321-8560
Order Desk	321-8543
Cash Receivables	321-8634
NTISearch (subject searches)	451-0560

INTRODUCTION

The National Technical Information Service (NTIS) is the central source for the public sale of Government-sponsored research and development reports, and other Government analyses prepared by Federal agencies, their contractors or grantees. Federally sponsored translations and some reports written in foreign languages also are available. The NTIS collection now exceeds 730,000 titles, to which some 60,000 new reports are added annually. The *Government Reports Announcements (GRA)* is published semimonthly by NTIS to simplify and improve public access to new report literature as it becomes available.

Announcements in this journal are arranged in the 22 subject fields recommended in the Committee on Scientific and Technical Information (COSATI) Subject Category List (AD-612 200). Each field is subdivided into groups.

A 'Locator List' at the end of the journal gives the COSATI field and group location for each report cited in the issue. This list is arranged alphanumerically by accession number. An 'Edge Index' on the back cover provides easy access to the subject fields within the journal.

PRICING INFORMATION. Reports in the NTIS collection are available indefinitely. Current prices are shown in the document entry price code. Document prices are subject to change without notice. For reports carrying the notation 'NOT AVAILABLE NTIS,' consult the report citation availability and pricing information.

The entry price code also indicates the form or forms in which the report is reproduced. Examples: PC (paper copy); MF (microfiche); magnetic tape (7- or 9-track, odd or even parity), punched cards; or microfilm.

INDEXES. *Government Reports Index (GRI)* is published concurrently with GRA and indexes the GRA abstracts by Corporate Author, Subject, Personal Author, Contract Number, and Accession/Report Number.

OTHER NTIS SERVICES. Because NTIS is the Federal coordinator and distributor of Government-sponsored research and development literature, it has many information products and services designed for specific audiences. To learn more about these products and services and how they can help you, send for your free copy of 'NTIS Information Services.' Ask for NTIS-PR-72-00.

SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the Journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

AD-785 921/8GA PC$4.25/MF$2.25
Lockheed-California Co Burbank
ABSTRACTS OF AERODYNAMICS DEPARTMENT COMPUTER PROGRAMS,
R. D. Elliott. 23 Aug 74, 54p Rept no. LR-26575

Descriptors: *Aerodynamics, *Computer programs, *Abstracts, User needs, Aerodynamic characteristics, Control systems, Aerodynamic stability, Aeronautics, Aerodynamic drag, Performance(Engineering).

This report consists of one-page abstracts of active batch processor or computer graphics programs in use by the Calac Aerodynamics Department. This report's purpose is to inform users and potential users of the availability of the programs, their computing costs, the status of their documentation, and the responsible parties to contact in Aerodynamics and Computer Services, as well as to provide brief descriptions of the programs. The active programs divide logically into three categories: those which generate aerodynamic coefficients such as lift and drag coefficients, usually from inputs consisting of geometry descriptions, Section 1; programs which compute performance such as ranged and takeoff distance, usually from input consisting of aerodynamic coefficient data, Section 2; and stability and control programs, Section 3.

AD-786 221/2GA PC$5.75/MF$2.25
West Virginia Univ Morgantown Dept of Aerospace Engineering
THRUST AUGMENTED WING SECTIONS IN POTENTIAL FLOW.
Scientific rept.,
James Dennis Wilson, John L. Loth, and Subrato Chandra. Aug 74, 148p Rept no. TR-25
Contract N00014-68-A-0512

Descriptors: *Wings, *Thrust augmentation, *Control jets, Airfoils, Incompressible flow, Ejectors, Jet flaps, Mathematical models, Computer programs, FORTRAN.
Identifiers: FORTRAN 4 programming language.

A method is presented for calculating the incompressible, potential flow for an arbitrary thrust augmented wing section, possibly experiencing inflow over portions of its surface. The solution includes the shape of an inviscid jet leaving the airfoil calculated by an automatic iteration procedure. The problem is formulated by covering the airfoil-jet surface with line segments which carry velocity discontinuity distributions and satisfy the boundary condition on velocity at the midpoints of the segments. Applying the boundary condition for a particular jet shape leads to a set of linear algebraic equations to be solved for the velocity discontinuity strengths. The final jet geometry is found when the net pressure force for each set of surface elements on the front and back of the jet is balanced by the centrifugal force acting on the fluid within the jet at the corresponding location. (Modified author abstract)

AD-786 222/0GA PC$6.25/MF$2.25
West Virginia Univ Morgantown Dept of Aerospace Engineering
NAVY V/STOL AERODYNAMICS.
Final summary rept. 15 Jul 68-28 Feb 74,
Jerome B. Fanucci, John L. Loth, Nathan Ness, and Richard E. Walters. Feb 74, 161p Rept no. TR-40
Contract N00014-68-A-0512

Descriptors: *Vertical takeoff aircraft, *Lifting surfaces, Aerodynamics, Two dimensional flow, Wings, Flow separation, Rotor blades, Numerical methods and procedures.

This report is a summary of a large number of research tasks performed in the area of low speed aerodynamics. The research projects are fundamental in nature but of relevance to the Navy. Both the theoretical and experimental aspects of each problem have been studied and the results are compared. Numerical methods have been used in self contained computer programs to calculate the aerodynamic performance of the following configurations: Two dimensional circulation controlled wings with blowing and regions of separated flow; two dimensional thrust augmented VTOL wings with jet entrainment effects; and rotors in hover with arbitrary twist, taper, and airfoil cross section using nonlinear lifting surface theory. Additional experimental work has been done in the area of rotor wake instabilities in and out of ground effect. (Modified author abstract)

N74-29367/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EFFECT OF SPANWISE BLOWING ON LEADING-EDGE VORTEX BURSTING OF A HIGHLY SWEPT ASPECT RATIO 1.18 DELTA WING.
W. L. Scantling, and B. B. Gloss. 15 Jul 74, 30p NASA-TM-X-71987

Descriptors: *Delta wings, *Leading edges, *Swept wings, *Vortices, *Wind tunnel tests, Aerodynamic characteristics, Aerodynamic configurations, Schlieren photography.

For abstract, see STAR 1219

N74-29368/9GA PC$7.00/MF$2.25
Sydney Univ. (Australia). Dept. of Aeronautical Engineering.
THREE COMPUTER PROGRAMMES TO CALCULATE THE STEADY OR UNSTEADY SUBSONIC CHARACTERISTICS OF LIFTING SURFACES IN GROUND EFFECT.
G. H. S. Pike. Jan 74, 78p ATN-7401

Descriptors: *Aerodynamic characteristics, *Aerodynamic configurations, *Computer programs, *Wing planforms, Ground effect, Numerical analysis, Performance prediction.

For abstract, see STAR 1219

N74-29370/5GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Flight Research Center, Edwards, Calif.
USE OF A PITOT-STATIC PROBE FOR DETERMINING WING SECTION DRAG IN FLIGHT AT MACH NUMBERS FROM 0.5 TO APPROXIMATELY 1.0.
L. C. Montoya, M. A. Economu, and R. E. Cissell. Jul 74, 22p NASA-TM-X-56025, H-844

Descriptors: *Aircraft wakes, *Drag measurement, *Flight tests, *Pitot tubes, Aerodynamic drag, Speed indicators, Wings.

For abstract, see STAR 1219

N74-29376/2GA PC$6.00/MF$2.25
National Research Council of Canada, Ottawa (Ontario). Div. of Mechanical Engineering.
ACOUSTIC TESTS ON A FAN-IN-WING MODEL: EFFECTS OF AN EXTENDED INLET.
G. Krishnappa. Feb 74, 58p NRC-13898, LR-576

Descriptors: *Acoustic measurements, *Fan in wing aircraft, *Lift fans, *Vertical takeoff aircraft, *Wind tunnel tests, Acoustic properties, Aerodynamic noise, Cross flow, Inlet flow, Sound propagation.

For abstract, see STAR 1219

N74-30415/5GA PC$4.50
National Aeronautics and Space Administration, Washington, D.C.
AERONAUTICAL ENGINEERING: A SPECIAL BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 43, APRIL 1974.
Apr 74, 120p NASA-SP-7037(43)

Descriptors: *Aerodynamics, *Aeronautical engineering, *Bibliographies, Aeronautics, Aircraft design, Aircraft engines, Ground support equipment.

For abstract, see STAR 1220

N74-30416/3GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF A SHORT ANNULAR DUMP DIFFUSER USING WALL TRAILING-EDGE SUCTION.
A. J. Juhasz. Aug 74, 21p NASA-TM-X-3093, E-7944

Descriptors: *Air flow, *Annular nozzles, *Flow characteristics, *Pressure gradients, *Trailing edges, *Wing slots, Diffusers, Flow equations, Numerical analysis, Pressure reduction.

For abstract, see STAR 1220

N74-30418/9GA PC$7.75/MF$2.25
Nielsen Engineering and Research, Inc., Mountain View, Calif.
ASSESSMENT OF A WAKE VORTEX FLIGHT TEST PROGRAM.
S. B. Spangler, M. F. E. Dillenius, R. G. Schwind, and J. N. Nielsen. Jul 74, 92p NASA-CR-114736, NEAR-TR-48
Contract NAS2-6973

Descriptors: *Aircraft wakes, *Flight tests, *Vortices, Contrails, Data reduction, T-33 aircraft.

For abstract, see STAR 1220

N74-30425/4GA PC$4.00/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
COMPARISON OF THE INFLUENCE OF HORIZONTAL AND VERTICAL GUST INTERFERENCES ON AIRCRAFT LONGITUDINAL MOTION.
G. Schaenzer. Jul 74, 7p NASA-TT-F-15801, DLR-MITT-70-12
Contract NASW-2483
Tran-Transl. Into English from the German Report Dir-Mitt-70-12. Conf-Presented at the Meeting of the Dglr Sci. Comm. On Flight Performance and Flight Characteristics, Darmstadt, 12-13 Nov. 1970.

Descriptors: *Aerodynamic forces, *Atmospheric turbulence, *Gust loads, *Turbulence effects, Aircraft stability, Longitudinal stability, Power spectra.

For abstract, see STAR 1220

N74-30426/2GA PC$4.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
SIMULATION OF ATMOSPHERIC TURBULENCE, IN PARTICULAR ITS INFLUENCE ON AIRCRAFT.
W. Schattenmann. Jul 74, 23p NASA-TT-F-15802, DLR-MITT-70-12
Contract NASW-2483
Tran-Transl. Into English from the Report Dir-Mitt-70-12 (Colonge), 1970, p 143-158. Conf-Presented at the Meeting of the Dglr Sci. Comm. On Flight Performance and Flight Characteristics, Darmstadt, West Ger., 12-13 Nov. 1970.

Descriptors: *Atmospheric turbulence, *Flight simulation, *Gust loads, *Turbulence effects, Aerodynamic forces, Aircraft performance, Flight characteristics.

For abstract, see STAR 1220

N74-30432/0GA PC$17.00/MF$2.25
Lockheed-Georgia Co., Marietta.
SMALL SCALE MODEL STATIC ACOUSTIC INVESTIGATION OF HYBRID HIGH LIFT SYSTEMS COMBINING UPPER SURFACE BLOWING WITH THE INTERNALLY BLOWN FLAP.
T. W. Cole, and E. A. Rathburn. Jul 74, 280p
NASA-CR-114757, LG74ER0096
Contract NAS2-7812

Descriptors: *Flow characteristics, *Jet flaps, *Lift augmentation, *Nozzle flow, *Short takeoff aircraft, Aerodynamic configurations, Flow visualization, Performance prediction, Pressure distribution.

For abstract, see STAR 1220

N74-30623/4GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A MODIFIED NEWTON-RAPHSON ANALYSIS OF FLIGHT MEASUREMENTS OF THE TRAILING VORTICES OF A HEAVY JET TRANSPORT.
L. W. Taylor, Jr., and M. D. Mclaughlin. Aug 74, 72p NASA-TN-D-7404, L-8838

Descriptors: *C-5 aircraft, *Flow distribution, *Newton-raphson method, *Turbulent wakes, *Vortex sheets, Aerodynamic configurations, Data processing, Flight tests.

For abstract, see STAR 1220

1B. Aeronautics

AD-786 146/1GA PC$4.75/MF$2.25
National Research Council of Canada Ottawa (Ontario) Div of Mechanical Engineering
QUARTERLY BULLETIN OF THE DIVISION OF MECHANICAL ENGINEERING AND THE NATIONAL AERONAUTICAL ESTABLISHMENT.
Rept. for 1 Apr-30 Jun 74.
30 Jun 74, 78p Rept no. DME/NAE-1974(2)
See also report dated 31 Mar 74, AD-779 009.

Descriptors: *Aeronautical laboratories, *Mechanical engineering, Gas dynamics, Hydraulic equipment, Aerodynamics, Hydrodynamics, Gas turbines, Canada.

The bulletin reviews ongoing research in the field of hydrodynamics, fluid mechanics, aerodynamics, and structural mechanics.

N74-29382/0GA PC$4.00/MF$2.25
Lockheed-Georgia Co., Marietta.
STUDY OF STABILITY OF LARGE MANEUVERS OF AIRPLANES.
Final Report.
E. K. Haddad. Aug 74, 76p NASA-CR-2447
Contract NAS1-11667

Descriptors: *Aircraft performance, *Aircraft stability, *Equations of motion, *Flight characteristics, Flight control, Maneuverability, Performance prediction, Stability derivatives.

For abstract, see STAR 1219

N74-30424/7GA PC$4.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
A SIMPLE CRITERION FOR REDUCTION OF MULTIPLE GUST LOADS WITH ACCELERATION CONTROL.
P. Hamel, and U. Graeber. Jul 74, 28p NASA-TT-F-15800, DLR-MITT-70-12
Contract NASW-2483

Trap-Transl. Into English from the German Report Dlr-Mitt-70-12. Conf-Presented at the Meeting of the Dgir Sci. Comm. On Flight Performance and Flight Characteristics, Darmstadt, 12-13 Nov. 1970.

Descriptors: *Atmospheric turbulence, *Flight control, *Gust alleviators, *Gust loads, *Turbulence effects, Aircraft performance, Aircraft stability, Numerical analysis, Perturbation theory.

For abstract, see STAR 1220

N74-30431/2GA PC$6.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
COMPUTER PROGRAMS FOR ESTIMATING AIRCRAFT TAKEOFF PERFORMANCE IN THREE DIMENSIONAL SPACE.
J. V. Bowles. Jul 74, 57p NASA-TM-X-62366

Descriptors: *Aircraft performance, *Computer techniques, *Flight characteristics, *Performance prediction, Flight paths, Short takeoff aircraft, Takeoff, Vertical takeoff aircraft.

For abstract, see STAR 1220

1C. Aircraft

AD-785 606/5GA PC$3.25/MF$2.25
Army Air Mobility Research and Development Lab Hampton Va Langley Directorate
AN ANALYTICAL EVALUATION OF AIRFOIL SECTIONS FOR HELICOPTER ROTOR APPLICATION,
Gene J. Bingham. 1972, 16p

Descriptors: *Helicopter rotors, *Airfoils, Leading edges, Camber, Lift to drag ratio, Aerodynamic characteristics, Geometry.

An analytical investigation has been initiated to define the lift coefficient - Mach number characteristics of airfoils of potential interest for helicopter application. Then, this analysis was extended to determine the relative importance of the airfoil geometric parameters such as thickness, thickness distribution, leading-edge radius, camber, and camber distribution on lift-Mach number characteristics.

AD-785 628/9GA PC$3.25/MF$2.25
Army Air Mobility Research and Development Lab Hampton Va Langley Directorate
HELICOPTER GROUND RESONANCE ANALYSIS IN LIGHT OF ARMY REQUIREMENTS,
Charles E. Hammond. 1974, 16p

Descriptors: *Helicopters, *Stability, Rotor blades(Rotary wings), Helicopter rotors, Degrees of freedom, Damping.
Identifiers: Ground resonance.

The Army has in recent years refined its methods of procuring aircraft. Unitil recently the Army had only procured aircraft which were more or less off-the-shelf items. That is, the aircraft were either developed for other military services or for civilian use and were adapted to meet Army needs. As a result, the Army was not significantly involved in the writing of specifications which affected the overall design of the vehicle. Operational experience has indicated, however, the need for specifications which reflect the particular requirements of Army aviation. This paper is concerned with requirements which have been imposed in the area of helicopter mechanical instability, or ground resonance as this phenomenon is commonly known, and the impact which these requirements have on the analyst.

AD-785 646/1GA PC$3.25/MF$2.25
Army Aviation Systems Test Activity Edwards AFB Calif
DETERMINATION OF AIRCRAFT CABIN RADIATION, CONDUCTION, AND CONVECTION HEAT TRANSFER COEFFICIENTS,
Emmett J. Laing. 1974, 15p

Descriptors: *Helicopters, *Aircraft cabins, *Temperature, Greenhouse effect, Solar radiation, Gradients, Solar heating, Heat transfer.

To properly design aircraft instruments, avionics, and other equipment, which is installed in aircraft cabin areas, it is necessary to accurately know the cabin temperature environment. Aircraft cabin temperatures vary widely depending on the aircraft operating condition, basic design parameters, and type of environmental control system installed. It is suspected that high aircraft cabin static temperatures may increase aircraft component failure rates, cause equipment to temporarily malfunction, and directly cause equipment failure. However, accurate temperature data for the static environment are not available for many aircraft. To obtain this type of data, USAASTA, with the assistance of the United States Army Air Mobility Research and Development Laboratory Eustis Directorate, has conducted comprehensive static temperature surveys on five first-line United States Army helicopters.

AD-785 657/8GA PC$3.25/MF$2.25
Army Natick Labs Mass
UNIFORM WIND TRAJECTORIES OF A GLIDING PARACHUTE USING AZIMUTH HOMING,
Arthur L. Murphy, Jr.. 1972, 12p

Descriptors: *Air drop operations, *Parachutes, *Parachute descents, Descent trajectories, Azimuth, Homing, Lift to drag ratio, Gliding.
Identifiers: Decelerators.

Conventional parachute systems must be launched at the lowest possible altitude in order to insure acceptable accuracy. Due to the need for such critical release point positioning, delivery aircraft are required to maneuver in a restrictive and generally unfavorable air space. This is particularly true for the majority of resupply missions necessitating an airdrop. It is, therefore, of interest to consider advanced airdrop techniques, with the objective of relaxing launch constraints while maintaining or improving drop zone accuracy. This paper is concerned primarily with the trajectory or flight path aspects of gliding parachute development. The presentation is analytic in scope, producing from geometric constraints imposed by the guidance scheme, a class of closed form solutions specifying trajectories and launch criteria.

AD-785 901/0GA PC$3.25/MF$2.25
Tactical Air Command Langley AFB Va Directorate Force Development and Analysis
CONCEPT OF OPERATIONS FOR A FULL MISSION FIGHTER SIMULATOR (FMFS).
10 Sep 74, 9p

Descriptors: *Jet fighters, *Mission profiles, *Flight simulators, Air to air, Air to surface, Weapon delivery, Formation flight, Refueling in flight, Electronic countermeasures, Electronic counter countermeasures, Human factors engineering.

This document sets forth the concept of operations of a full mission fighter simulator which provides visual and radar simulation for supplemental training in air-to-air, air-to-ground, formation/refueling and ECM/ECCM mission profiles. (Author)

AD-785 929/1GA PC$4.25/MF$2.25
Lockheed-California Co Burbank
PREDICTION OF ROTOR/PROPELLER ROTATIONAL NOISE,
G. J. Healy. 20 Jun 68, 54p Rept no. LR-21206

Descriptors: *Rotor blades(Rotary wings), *Propellers(Aerial), *Propeller noise, Propeller

blades, Aerodynamic noise, Vortex shedding, Thrust, Drag, Noise pollution.
Identifiers: IBM360 computers.

An analysis of the rotational noise sound field of a rotor/propeller has been carried out. The resulting equations have been programmed on an IBM-360 computer. The program has been successfully checked out by comparison with existing theory. Also, a short parametric study has been carried out as part of the computer program evaluation.

AD-786 118/0GA PC$4.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
CERTAIN DEVELOPMENT TRENDS IN THE MECHANICS OF DEFORMABLE BODY IN KAZAN.
K. Z. Galimov. 29 Jul 74, 53p Rept no. FTD-MT-24-341-74
Edited machine trans. of Issledovaniya po Teorii Plastin i Obolochek (USSR) n9 p55-92 1972, by Victor Mesenzeff.

Descriptors: *Aircraft, *Structural mechanics, Airframes, Kinematics, Aeroelasticity, Vibration, Translations, USSR.
Identifiers: Kazan Aviation Institute, *Engineering design.

Scientific work of the collective of the department of structural mechanics of flying vehicles of KAI (Kazan Aviation Institute), from the day the department was created, is progressing in the following two basic directions: the development of the calculation methods for the structural strength of flying vehicles and experimental studies of their static and dynamic strength; and the development and perfection of methods of the theory elasticity. This work is devoted only to the first direction.

AD-786 122/2GA PC$3.25/MF$2.25
Advisory Group for Aerospace Research and Development Paris (France)
TECHNICAL EVALUATION REPORT ON THE AGARD SPECIALISTS MEETING ON DESIGN AGAINST FATIGUE.
Advisory rept.,
J. B. de Jonge. Aug 74, 16p Rept no. AGARD-AR-71
NATO furnished.

Descriptors: *Tactical aircraft, *Fatigue(Mechanics), *Life cycles, Predictions, Structural properties, Aerodynamic loading, Tolerances(Mechanics), Meetings, Military aircraft.

Considering that the requirements for fatigue life prediction of tactical aircraft vary widely between NATO countries, it seemed necessary to set up a Working Group, within the Structures and Materials Panel, to explore the problem and to propose, where possible, generally acceptable solutions. The Evaluation Report discusses the first step toward such a goal, the convening of a Specialists Meeting on 'Design Against Fatigue', held in The Hague, on October 9 and 10, 1973. Sixty-four Specialists attended the Meeting. Eight papers were presented the first day, and a round table discussion was held on the second day under the chairmanship of Professor J. Schijve from the Netherlands. The Meeting helped to clarify the objectives of the Working Group and to generate proposals for future action. This Evaluation Report shows, by the conclusions drawn concerning inspection of structures, fatigue load monitoring and the need for full scale tests, that the Specialists Meeting was a very important milestone in the progress toward a better understanding of the fatigue problems of military aircraft.

AD-786 198/2GA Reprint
Delaware Univ Newark Dept of Mechanical and Aerospace Engineering
STABILITY AND CONTROL OF HINGELESS ROTOR HELICOPTER GROUND RESONANCE.
Maurice I. Young, and David J. Bailey. 8 Apr 74, 9p AROD-9549.8-E
Grant DA-ARO-D-31-124-71-G112
Revision of report dated 13 Jun 73.
Availability: Pub. in Jnl. of Aircraft, v11 n6 p333-339 Jun 74.

Descriptors: *Helicopters, *Rotary wings, Rotor blades(Rotary wings), Aerodynamic stability, Resonant frequency, Oscillation, Feedback.
Identifiers: Hingeless rotors.

The ground resonance instability of advanced helicopters employing hingeless rotors is examined on a broad parametric basis and a variety of conditions affording inherent stability are determined. Moderate levels of blade internal structural damping in conjunction with typical landing gear damping and stiffness characteristics are shown to be highly effective. This is shown to be a consequence of the offsets of the virtual flapping and lead-lag hinges together with the tuning of the elastically flapping and lead-lagging blades of a hingeless rotor system. Size and scale effects are also included by examining aerodynamically scaled designs which range in gross weight from 5,120 to 48,000 lb. Closed-loop stabilization of the ground resonance instability is considered by using a conventional helicopter swash-plate-blade cyclic pitch control system in conjunction with roll, roll rate, pitch, and pitch rate sensing. This also is shown to be highly effective due to the enormous control power inherent in the advanced hingeless rotor blade designs compared to that of the freely flapping, conventional rotors. (Author

N74-29374/7GA PC$7.00/MF$2.25
Boeing Commerical Airplane Co., Renton, Wash.
BRAKE CONTROL SYSTEM MODIFICATION, AUGMENTOR WING JET STOL RESEARCH AIRPLANE (AWJSRA).
R. L. Amberg, J. A. Arline, and R. W. Jenny. 24 Jun 74, 78p NASA-CR-137530, D6-41896
Contract NAS2-7641

Descriptors: *Aircraft brakes, *Landing gear, *Short takeoff aircraft, Computerized simulation, Equipment specifications, Performance tests.

For abstract, see STAR 1219

N74-29375/4GA PC$9.50/MF$2.25
American Airlines, Inc., New York.
ASSESSMENT OF THE APPLICATION OF ADVANCED TECHNOLOGIES TO SUBSONIC CTOL TRANSPORT AIRCRAFT.
Final Report.
J. D. Graef, G. P. Sallee, and J. T. Verges. Aug 74, 128p NASA-CR-132461
Contract NAS1-12148

Descriptors: *Aircraft design, *Aircraft performance, *Transport aircraft, Cost effectiveness, Economic analysis, Operations research.

For abstract, see STAR 1219

N74-29377/0GA PC$4.75/MF$2.25
Brussels Univ. (Belgium). Inst. de Mecanique Appliquee.
OPTIMAL DIMENSION OF A BELL SHAPED HOVERCRAFT DIMENSIONNEMENT OPTIMAL DES AEROGLISSEURS EN CLOCHE.
A. L. Jaumotte, A. Kiedrzynski, and S. Verbiese. 1974, 33p NT-34
Language in French.

Descriptors: *Dimensions, *Ground effect machines, *Optimization, *Propulsion, Computerized design, Formulas (Mathematics), Performance.

For abstract, see STAR 1219

N74-30427/0GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A SIMULATOR INVESTIGATION OF ENGINE FAILURE COMPENSATION FOR POWERED-LIFT STOL AIRCRAFT.
A. W. Nieuwenhuijse, and J. A. Franklin. May 74, 69p NASA-TM-X-62363

Descriptors: *Aircraft performance, *Engine failure, *Flight simulation, *Short takeoff aircraft, Aircraft stability, Display devices, Flight characteristics, Warning systems.

For abstract, see STAR 1220

N74-30433/8GA PC$12.25/MF$2.25
Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.
PARACHUTE DYNAMICS AND STABILITY ANALYSIS.
Final Report, 1 Feb. 1973 - 1 Feb. 1974.
S. K. Ibrahim, and R. A. Engdahl. Feb 74, 181p NASA-CR-120326
Contract NAS8-28607

Descriptors: *Equations of motion, *Nonlinear equations, *Parachutes, Mathematical models, Payloads, Space shuttles.

For abstract, see STAR 1220

N74-30434/6GA PC$5.00/MF$2.25
Translation Consultants, Ltd., Arlington, Va.
THE AIRCRAFT AND NATURAL CLIMATE CONDITIONS.
K. M. Shpilev, and A. B. Kruglov. Jul 74, 151p NASA-TT-F-793
Contract NASW-2038
Tran-Transl. Into English of the Book "Samoleti Prirodno-Klimaticheskiye Usloviya" - Moscow, Military Press of the USSR Ministry of Defense, 1972 172 p.

Descriptors: *Aircraft equipment, *Airframes, *Cold weather tests, *Environmental tests, *Service life, Aircraft maintenance, Ground support equipment, Operations research, Reliability analysis.

For abstract, see STAR 1220

PAT-APPL-496 779 PC$5.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SINGLE WING SUPERSONIC AIRCRAFT.
Patent Application.
R. T. Jones. Filed 12 Aug 74, 40p NASA-CASE-ARC-10470-3
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Airfoils, *Supersonic aircraft, Aerodynamic configurations, Fuselages, High speed, *Patent applications.

An aircraft is described, having a single fuselage with a main wing and a horizontal stabilizer airfoil pivotally attached at their centers to the fuselage. The pivotal attachments allow the airfoils to be yawed relative to the fuselage for high speed flight, and to be positioned at right angles with respect to the fuselage during takeoff, landing, and low speed flight. The main wing and the horizontal stabilizer are upwardly curved from their center pivotal connections towards their ends to form curvilinear dihedrals.

PATENT-3 826 448 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
DEPLOYABLE FLEXIBLE VENTRAL FINS FOR USE AS AN EMERGENCY SPIN RECOVERY DEVICE IN AIRCRAFT.
Patent.
S. M. Burk, Jr. Patented 30 Jul 74, 13p PAT-APPL-289 018

Misc-Filed 14 Sep. 1972 Supersedes N73-10031 (11 - 01, p 0004).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Aircraft safety, *Fins, *Flexible bodies, *Safety devices, *Spin stabilization, Aircraft equipment, Deployment, *Patents, Planforms, Retractable equipment.
Identifiers: PAT-CL-244-91.

A flexible fin device for mounting on an aircraft to effect spin recovery is described. The device may be selectively deployed to provide a triangular planform of flexible material to provide spin recovery, and retracted for compact storage during non-use. A single flexible fin may be deflected in a specific direction depending on direction of spin rotation, or two flexible fins forming an inverted V configuration may be used. The device is mounted on the underbody of the aircraft.

1D. Aircraft Flight Control and Instrumentation

N74-30429/6GA PC$9.75/MF$2.25
Rockwell International Corp., Columbus, Ohio. Aircraft Div.
DIGITAL FLIGHT CONTROL ACTUATION SYSTEM STUDY.
Final Report.
R. Rossing, and R. Hupp. Apr 74, 490p NASA-CR-132447, NR74H-47A
Contract NAS1-12718

Descriptors: *Aircraft control, *Aircraft equipment, *Electric motors, *Fly by wire control, Computer techniques, Numerical analysis, Performance prediction, Systems engineering.

For abstract, see STAR 1220

1E. Air Facilities

AD-785 857/4GA PC$4.75/MF$2.25
Connecticut International Corp Windsor Locks Sepco Div
DEVELOPMENT OF EDGE LIGHTS FOR AIRPORT RUNWAYS AND TAXIWAYS.
Final rept. Oct 71-Jun 73,
Stanley N. Poulsen. Feb 74, 77p Rept no. 7309 FAA-RD-74-67
Contract DOT-FA72WA-2726

Descriptors: *Runways, *Terminal flight facilities, *Marker lights, Structural members, Assembly, Installation, Environmental tests, Landing aids, Lighting equipment.

A design and development program was conducted to produce lower cost elevated edge lights with improved performance for use as visual aids on airport runways and taxiways. High intensity semi-flush runway edge light assemblies with light output in the main beams equal to the high intensity elevated edge light output were also produced. The light assemblies will withstand temperature extremes from -55C to +55C, jet blasts up to and including 350 mph, high humidity as well as other severe environmental conditions. (Author)

2. AGRICULTURE

2C. Agricultural Engineering

PB-235 909/9GA PC-GPO/MF$2.25-NTIS
Michigan State Univ., East Lansing. Dept. of Crop and Soil Sciences.
SOIL MODIFICATION FOR DENITRIFICATION AND PHOSPHATE REDUCTION OF FEEDLOT WASTE.
Environmental protection technology series,
A. E. Erickson, B. G. Ellis, J. M. Tiedje, A. R. Wolcott, and C. M. Hansen. Jun 74, 128p W74-12216, EPA-660/2-74-057
Paper copy available from GPO.

Descriptors: *Industrial waste treatment, *Agricultural wastes, *Soil properties, Dairy cattle, Swine, Aerobic bacteria, Nitrification, Anaerobic processes, Filtration, Permeability, Pilot plants, Inorganic phosphates, Flushing, Waste water, Barriers, Thermoplastic resins.
Identifiers: *Feedlot wastes, Denitrification, *Manure.

The efficiency of pilot-size Barriered Landscape Water Renovation Systems (BLWRS) to renovate flushed livestock waste was studied. The BLWRS is a modified permeable soil that has an aerobic zone for the filtering and oxidation of the waste and an anaerobic zone to which an energy source is added to create an environment for denitrification. Two pairs of BLWRS 0.008 ha. in size were constructed using a polyvinyl barrier to create the anaerobic zone and contain the effluent. Flush waste from swine or dairy cattle were applied on each pair of BLWRS. The waste effluents and BLWRS soil were periodically analyzed for nutrients, oxygen demand and pathogens. The BLWRS has been shown to be an efficient system for renovating large quantities of livestock waste and should be tested on a commercial scale with continuous monitoring.

2D. Agronomy and Horticulture

N74-29445/5GA PC$8.25/MF$2.25
Direction de la Meteorologie Nationale, Paris (France).
EVAPOTRANSPIRATION: AGROMETEOROLOGICAL ASPECT. PRACTICAL EVALUATION OF EVAPOTRANSPIRATION POTENTIAL LEVAPOTRANSPIRATION: ASPECT AGROMETEOROLOGIQUE EVALUATION PRATIQUE DE LEVAPOTRANSPIRATION POTENTIELLE.
P. Brochet, and N. Gerbier. Mar 74, 101p
Language in French.

Descriptors: *Agriculture, *Climatology, *Evaporation rate, *Transpiration, Formulas (Mathematics), Ground water, Plants (Botany).

For abstract, see STAR 1219

N74-30055/9GA PC$5.75/MF$2.25
Northeastern Univ., Boston, Mass.
STUDY OF AIR POLLUTANT SIGNATURES FOR REMOTE SENSING.
Final Report.
W. B. Nowak. 30 Jun 74, 51p NASA-CR-138966
Contract NGR-22-011-072

Descriptors: *Air pollution, *Plants (Botany), *Remote sensors, *Spectral signatures, Contaminants, Earth resources, Exposure, Ozone, Sulfur oxides.

For abstract, see STAR 1219

ORO-4180-4 PC$5.75/MF$2.25
Tennessee Univ., Knoxville.
DYNAMICS AND METHODS INVOLVED IN THE REVEGETATION OF AMCHITKA ISLAND. 1. REVEGETATION OF DAMAGED AREAS. 2. PRIMARY CONSUMER EFFECTS ON VEGETATION. ANNUAL REPORT, JANUARY 1, 1973—APRIL 1, 1974.
C. C. Amundsen. Apr 74, 51p
Contract AT(40-1)-4180

Descriptors: (*Amchitka island area, *Plant growth), Diet, Distribution, Food, Plant breeding, Plants, Rats.

For abstract, see NSA 30 08, number 21176.

2E. Animal Husbandry

AD-785 801/2GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
THE RELATIONSHIP BETWEEN HEMAGGLUTINATING ANTIBODY TITERS AND INFECTION WITH 'TOXOPLASMA GONDII' IN SWINE.
Technical rept.,
Philip T. Durfee, Setia Budhi Leksana, Sam W. Joseph, and Clementinus Koesharjono. Mar 74, 11p Rept no. NAMRU-2-TR-609
Availability: Pub. in the Southeast Asian Jnl. of Tropical Medicine and Public Health, v5 n1 p4-8 Mar 74.

Descriptors: *Toxoplasma, *Agglutinins, *Serodiagnosis, Antibodies, Swine, Parasitic diseases, Veterinary medicine.
Identifiers: Toxoplasma gondii, Indirect hemagglutination tests.

The reliability of the indirect hemagglutination (IHA) test to detect infection with Toxoplasma gondii in swine was studied by using matched serum and diaphragm muscle samples from 31 individual pigs. T. gondii was isolated from 9 (29%) of 31 diaphragms while only 2 (6.5%) of 31 sera showed an IHA titer of 1:64 or greater. Sera were also tested for dye test antibodies and results indicated good correlation between dye test and isolation of the organisms. The apparent lack of sensitivity of the IHA test with swine sera is discussed and it is suggested that while the IHA test appears to be specific for T. gondii antibodies it may be inappropriate for use as a test for the prevalence of the parasite in swine populations.

AD-786 016/6GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
CLINICAL AND EXPERIMENTAL INVESTIGATIONS INTO ALLERGIC DISEASES IN DOMESTIC ANIMALS: THE ROLE OF NUTRITIVE ALLERGIES IN SOME DIGESTIVE AND SKIN DISEASES OF SOME CARNIVEROUS ANIMALS,
V. Sertic. 26 Aug 74, 25p Rept no. FTD-HC-23-1892-74
Edited trans. of Veterinarski Arhiv (Yugoslavia) v37 n5/6 p147-158 1967.

Descriptors: *Allergic diseases, *Skin diseases, *Gastrointestinal diseases, *Domestic animals, Diagnosis(Medicine), Food, Meat, Etiology, Carnivora, Immunology, Translations, Yugoslavia.
Identifiers: *Food allergies, Allergens, Skin tests.

The allergic condition caused in dogs by food allergens occurs in three forms, i.e. in the gastrointestinal, skin (dermatologic), and combined forms. In the first case there are functional and anatomic disturbances in the gastrointestinal region, spastic conditions and catarrhal phenomena to hemorrhagic inflammations. In the second case urticaria and polymorphous dry eczema of typical location with itching of varying degrees is involved. The largest percentage of positive skin reactions falls under the grouped meat allergens (group II meats: 61%, group I meats: 48%), milk (53%), bacterial vaccines (6%). Out of the individual allergens 27% reacted to horse meat, 24% to beef, 22% to chicken, 18% to pork, 14% to veal, 13% to mutton, 6% to Cacao, 4% to eggs, and 2% to potatoes from the total number of animals tested.

2F. Forestry

AD-786 178/4GA Reprint
Colorado State Univ Fort Collins Coll of Forestry and Natural Resources
EFFECTS OF CHANGING CANOPY DIRECTIONAL REFLECTANCE ON FEATURE SELECTION,
J. A. Smith, and R. E. Oliver. 9 Jul 73, 8p AROD-9928.3-EN

Grant DA-ARO-D-31-124-71-G165, Contract NAS9-12972
Edited version of article presented at the Remote Sensing of Earth Resources Conference (2nd), held at Tennessee Univ., Space Inst., Tullahoma on Mar 73.
Availability: Pub. in Applied Optics, v13 n7 p1599-1604 Jul 74.

Descriptors: *Canopies, *Tree canopy, *Target recognition, Vegetation, Reflectance, Optical properties, Pattern recognition, Monte Carlo method.
Identifiers: *Remote sensing.

A Monte Carlo model was used to predict the mean apparent directional reflectance of a simulated plant canopy and the covariance for seven wavelength channels in the visible portion of the spectrum. The non-Lambertian spectral response from Bouteloua gracilis canopies possessing two plant cover densities was simulated for two solar positions. The calculated spectral signatures as a function of look angle were then analyzed using the divergence criteria to select the best two wavelength channels for discrimination. These calculations indicate that different combinations of wavelength channels are appropriate for various sensor look angles, that target signatures have greater statistical separation for some scan angles than others, and that these effects are time varying. (Author)

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-786 157/8GA PC$3.75/MF$2.25
Stanford Research Inst Menlo Park Calif
REAL-TIME CORRECTION OF ATMOSPHERICALLY DEGRADED TELESCOPE IMAGES THROUGH IMAGE SHARPENING.
Technical rept.,
Richard A. Muller, and Andrew Buffington. Jul 74, 50p Rept no. SRI-JSR-73-9
Contract DAHC15-73-C-0370, ARPA Order-2504

Descriptors: *Astronomical instruments, *Telescopes, *Image processing, Interferometers, Optical images, Distortion, Real time, Computerized simulation.
Identifiers: *Atmospheric distortion, Image enhancement, *Astromical telescopes.

A new technique for the correction of atmospheric distortion in a telescope is presented. Most of this distortion arises from a random phase variation in the incoming light across the telescope aperture. This variation limits the resolving power of even large telescopes to about one second of arc. If one defines the 'sharpness' value of the images in a suitable way, this sharpness is maximized only when the phase distortion of the incoming light is zero. The report presents computer simulations of a simple feedback system in which flexible optical elements, adjusted to maximize the sharpness, correct most of the atmospheric distortion. (Modified author abstract)

N74-30276/1GA PC$4.00/MF$2.25
Hawaii Univ., Honolulu. Inst. for Astronomy.
MAUNA KEA OBSERVATORY INFRARED OBSERVATIONS.
Final Report, 1 Apr. 1972 - 30 Jun. 1974.
J. T. Jefferies. 30 Jun 74, 6p NASA-CR-138965
Contract NGR-12-001-111

Descriptors: *Galactic radiation, *Hawaii, *Infrared radiation, *Stellar radiation, Astronomical observatories, Astronomy, Radiometers, Spectroscopic analysis.

For abstract, see STAR 1219

N74-30293/6GA PC$6.75/MF$2.25
Lowell Observatory, Flagstaff, Ariz.
PLANETARY RESEARCH CENTER.
Final Report, 1 Jul. 1968 - 30 Jun. 1974.
W. A. Baum, R. L. Millis, and E. L. G. Bowell. 31 Jul 74, 73p NASA-CR-138941
Contract NGR-03-003-007
Misc-Original Contains Color Illustrations.

Descriptors: *Astronomical photography, *Jupiter (Planet), *Mars (Planet), *Planetary atmospheres, *Planetary surfaces, *Venus (Planet), Albedo, Color photography, Interplanetary dust, Mariner 9 space probe, Topography, Ultraviolet photography.

For abstract, see STAR 1219

N74-30898/2GA PC$4.50/MF$2.25
Arizona Univ., Tucson. Optical Sciences Center.
THE DESIGN, CONSTRUCTION AND TESTING OF THE OPTICS FOR A 147-CM-APERTURE TELESCOPE.
R. A. Buchroeder, L. H. Elmore, R. V. Shack, and P. N. Slater. Dec 72, 30p NASA-CR-139486, TR-79
NASA ORDER W-12885, Contract F19628-72-C-0047

Descriptors: *Astronomical telescopes, *Lunar rangefinding, *Optical equipment, Lunar retroreflectors, Mirrors, Polishing, Systems analysis.

For abstract, see STAR 1220

N74-31298/4GA PC$5.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
REFLECTION AND REPROCESSING OF THE RADIATION OF AN X-RAY SOURCE BY THE ATMOSPHERE OF A NORMAL STAR IN A BINARY SYSTEM.
M. M. Basko. 26 Jul 74, 42p NASA-TT-F-15769, PREPRINT-146
Contract NASW-2483
Tran-Transl. Into English from the Russian Preprint-146.

Descriptors: *Binary stars, *Signal reflection, *Stellar atmospheres, *X ray sources, Compton effect, Cygnus constellation, Optical reflection, Photoabsorption.

For abstract, see STAR 1220

N74-31309/9GA PC$5.25/MF$2.25
Instituto y Observatorio Astronomico de Marina, San Fernando (Spain).
LUNAR OCCULTATION OF THE STARS OCULTACIONES DE ESTRELLAS POR LA LUNA.
May 74, 42p
In French; English Summary.

Descriptors: *Lunar occultation, *Stars, Ephemeris time, Least squares method.

For abstract, see STAR 1220

N74-31321/4GA PC$5.00/MF$2.25
Dartmouth Coll., Hanover, N.H.
RESULTS OF X-RAY AND OPTICAL MONITORING OF SCO X-1.
D. E. Mook, R. J. Messina, W. A. Hiltner, R. Belian, and J. Conner. 1974, 41p NASA-CR-139568
Contract NGR-23-005-464

Descriptors: *Astronomy, *Stars, *X rays, Brightness, Histograms, Optical properties.

For abstract, see STAR 1220

N74-31322/2GA PC$4.00/MF$2.25
Cerro Tololo Inter-American Observatory, La Serena (Chile).
PHYSICAL PARAMETERS OF THE CEN X-3 SYSTEM.
P. S. Osmer, W. A. Hiltner, and J. A. J. Whelan. 1974, 10p NASA-CR-139569
Contract NGR-23-005-464

Descriptors: *Astronomy, *Spectral emission, *Stars, Absorption spectra, Spectrograms, X rays.

For abstract, see STAR 1220

N74-31323/0GA PC$4.00/MF$2.25
Michigan Univ., Ann Arbor.
PHOTOELECTRIC OBSERVATIONS OF KRZEMINSKI'S STAR, THE COMPANION OF CEN X-3.
L. D. Petro. 1974, 15p NASA-CR-139570
Contract NGR-23-005-464

Descriptors: *Photoelectricity, *Stars, *X rays, Astronomy, Light (Visible radiation), Optical properties.

For abstract, see STAR 1220

3B. Astrophysics

AD-785 999/4GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
TECHNICAL DETAILS OF THE POLISH EXPERIMENT WITH THE GEOPHYSICAL ROCKET VERTIKAL-1 AND VERTIKAL-2.
Marek Hlond. 27 Aug 74, 9p Rept no. FTD-HC-23-2734-74
Edited trans. of Pomiary, Automatyka, Kontrola (Poland) v19 n5 p205-206 May 73.

Descriptors: *Astrophysics, Sounding rockets, Solar x rays, Ultraviolet radiation, Translations, Poland.

Certain technical details are discussed of the first Polish space experiment conducted from on board the Soviet geophysical rockets VERTIKAL-1 and VERTIKAL-2. A block diagram is given of the scientific equipment for the investigation of the Sun's x-ray and ultraviolet radiation installed on the rocket.

AD-786 036/4GA PC$3.75/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
BAND IRRADIATOR WITH ELECTRICAL SCANNING OF RADIATION PATTERN (3),
S. N. Ivanov, Yu. P. Ilyasov, and G. N. Khramov. 27 Apr 74, 28p Rept no. FSTC-HT-23-204-74
Trans. of Akademiya Nauk SSSR. Fizicheskii Institut. Trudy, v28 p22-38 1965.

Descriptors: *Radio telescopes, *Phased arrays, Electronic scanners, Antenna arrays, Translations, USSR.

Development of a band irradiator for the North-South line of the cross-shaped radiotelescope of the Physics Institute imeni P. N. Lebedev of the USSR Academy of Sciences is discussed. It is shown theoretically possible to build a feeder system permitting a significant reduction in systematic errors arising in the amplitude-phase distribution at the irradiator when there is a mismatch in vibrators with the supply feeder in an assigned radiation pattern scanning sector.

AD-786 139/6GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
THE LOOP PROMINENCE OF 11 AUGUST 1972: A CORONAL CONTINUUM EVENT.
Scientific interim rept.,
R. R. Fisher. 28 Dec 73, 10p Rept no. AFCRL-TR-74-0404
Availability: Pub. in Solar Physics, v35 p401-408 1974.

Descriptors: *Solar corona, Solar flares, Electron density, Spectrum analyzers.

Observations of a loop prominence formed after the flare of 11 August 1972 are discussed. Estimates of electron density are obtained from (a) the line ratio of the Ca xv forbidden lines and (b) a hompson scattering model5 Both methods give an approximate value of (N sub e) = 10 to the 11th power/cc. This density was high enough to render the loop structures visible as continuum features, corresponding to the Ca xv structures as seen in the plane of the sky. By a double exposure technique, it was found that the loop structures seen in H alpha and Fe xiv differ significantly. (Author)

AD-786 140/4GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
A SEARCH FOR THE FOOTPOINTS OF SOLAR MAGNETIC FIELDS.
Scientific interim rept.,
G. W. Simon, and J. B. Zirker. 30 Sep 73, 14p Rept no. AFCRL-TR-74-0405
Revision of report dated 2 Apr 73.
Availability: Pub. in Solar Physics, v35 p331-342 1974.

Descriptors: *Solar structure, Magnetic fields, Line spectra.
Identifiers: *Solar magnetic fields.

High-resolution measurements of magnetic fields have been made in quiet and active regions in order to determine whether the photospheric fine-structures ('crinkles'), recently photographed by Dunn (1972), coincide with the footpoints of strong, compact fields. Magnetic fields ranging up to 1400 G have been measured in small structures that lie at the centers of spicule bushes or within a plage. However, the diameters of the flux tubes, at the height where Fe I 6302.5 forms, are typically 1in -2in, compared with crinkle dimensions of 0.25in x 1in. This discrepancy cannot be explained by a sharp height variation of the flux tube cross-section. (Modified author abstract)

AD-786 265/9GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ON THE PRESENCE OF GRAPHITE IN THE INTERSTELLAR MEDIUM.
Journal article,
S. J. Czyzak, and J. J. Santiago. 30 Apr 73, 18p
Rept no. ARL-74-0058
Availability: Pub. in Jnl. of Astrophysics and Space Science v23 p443-458 1973.

Descriptors: *Interstellar matter, *Graphite, Interstellar space, Single crystals, Growth(General), Structural properties, Mechanical properties, Thermal properties, Electrical properties, Magnetic properties, Optical properties, Chemical properties.

The justification for the presence of graphite in the interstellar medium is examined. The conditions necessary for growth of graphite (single crystals) and other structurally disordered carbons are discussed. The effect of structural imperfections on the mechanical, thermal, electrical, magnetic, optic and chemical properties is illustrated. From this information it is concluded that the existence of graphite (single crystals) in the interstellar medium is unlikely. (Modified author abstract)

AD-915 362/8GA PC$4.25/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
SOLAR VIDEOMETER: AN AUTOMATIC SOLAR FLARE IDENTIFICATION AND CLASSIFICATION SYSTEM.
Research and Development rept. Sep 68-Aug 73,
P. E. Argo, D. A. Wulfing, and V. E. Hildebrand. Aug 73, 57p NELC-TR-1890
Distribution Limitation now Removed.

Descriptors: *Solar flares, Data acquisition, Forecasting, Automatic, Identification, Classification, Radiofrequency interference, Mathematical prediction, Vidicons, Telescopes, Digital computers, Analog to digital converters, Digital to analog converters, Astronomical cameras, Real time.
Identifiers: *Solar videometers, *Videometers.

The effect of solar flares upon radio communication on earth has been established, and is one of the chief reasons for interest in solar-geophysical phenomena. Voluminous data have been laboriously collected and analyzed, but the existence of discrepancies among observations made to date indicates a need for more facile data acquisition and more objective techniques of classification. The project reported here achieves these objectives via the development of a digital videometer system with computer control of acquisition and analysis. The system brings real-time prediction capability within reach for the first time.

COM-74-50190-358-1/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 358, JUNE 1974. PART I (PROMPT REPORTS). DATA FOR MAY 1974, APRIL 1974,
Hope I. Leighton. Jun 74, 122p SGD-358-Pt-1
NOAA-74072245
See also Part 2, COM-74-50190-358-2.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part including extra issue. $1.25/copy for either part.

Descriptors: Graphs(Charts), Tables(Data), Solar flares, Sunspots, Solar radio emission, Magnetic disturbances, Solar x rays, Solar radiation, Indexes(Documentation), Statistical data.
Identifiers: Pioneer 9 spacecraft.

Prompt reports are given on data for May 1974 and April 1974. These deal with alert periods, daily solar indices, solar flares, solar radio waves and spacecraft observations. This issue also includes an index for 1973 and 1974.

COM-74-50190-358-2/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 358, JUNE 1974. PART II (COMPREHENSIVE REPORTS). DATA FOR DECEMBER 1973, NOVEMBER 1973 AND MISCELLANEA,
Hope I. Leighton. Jun 74, 49p SGD-358-Pt-2
NOAA-74072246
See also Part 1, COM-74-50190-358-1.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part including extra issue. $1.25/copy for either part.

Descriptors: *Solar activity, Solar flares, Solar radio emission, Solar x rays, Tables(Data), Graphs(Charts), Magnetic storms, Solar radiation.
Identifiers: Explorer 37 satellite.

Comprehensive data for December 1973 and November 1973 on solar flares, solar radio waves, solar x-ray radiation, abbreviated calendar record, and regional flare index are provided.

COM-74-50190-359-1/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 359, JULY 1974. PART I (PROMPT REPORTS). DATA FOR JUNE 1974, MAY 1974,
Hope I. Leighton. Jul 74, 123p SGD-359-Pt-1
NOAA-74081306
See also Part 2, COM-74-50190-359-2.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part including extra issue. $1.25/copy for either part.

Descriptors: *Solar activity, Tables(Data), Ionospheric disturbances, Solar flares, Sunspots, Solar radiation, Solar cosmic rays, Solar radio emission, Geomagnetism, Solar x rays, Magnetic disturbances, Indexes(Documentation), Magnetic storms, Graphs(Charts), Statistical data.

Data for June 1974 and May 1974 are given on alert periods, daily solar indices, solar flares, solar radio waves and spacecraft observations. This issue also includes an index for 1973 and 197[illegible]

COM-74-50190-359-2/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 359, JULY 1974. PART II (COMPREHENSIVE REPORTS). DATA FOR JANUARY 1974, DECEMBER 1973 AND MISCELLANEA,
Hope I. Leighton. Jul 74, 56p SGD-359-Pt-2
NOAA-74081307
See also Part 1, COM-74-50190-359-1.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part including extra issue. $1.25/copy for either part.

Descriptors: *Solar activity, Tables(Data), Graphs(Charts), Solar flares, Sunspots, Solar radio emission, Solar x rays, Solar radiation.
Identifiers: Explorer 37 satellite.

Comprehensive data for January 1974 and December 1973 on solar flares, solar radio waves, solar x-ray radiation, abbreviated calendar record, and regional flare index are given.

CONF-730804-P5 PC$39.00/MF$2.25
Denver Univ., Colo.
13TH INTERNATIONAL COSMIC RAY CONFERENCE, DENVER, COLORADO, 17--30 AUGUST 1973. VOLUME 5. MISCELLANY, INVITED LECTURES AND MEMORIAL SESSIONS, RAPPORTEUR PAPERS.
1973, 719p

Descriptors: (*Cosmic radiation, *Meetings), Leading abstract.

For abstract, see NSA 30 08, number 21945.

N74-30257/1GA PC$5.50/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
AN INVESTIGATION OF THE STRUCTURE AND COMPOSITION OF THE SOLAR ATMOSPHERE USING X-RAY AND EUV SPECTRA OBTAINED WITH THE OV1-17 AND OSO-4 AND OSO-5 SATELLITES.
Semiannual Status Report, 1 Jan. - 30 Jun. 1974.
A. B. C. Walker, Jr.. Jul 74, 50p NASA-CR-138944, SASR-1
Contract NGR-05-020-695

Descriptors: *Atmospheric composition, *Solar atmosphere, *Solar corona, *Stellar structure, Oso-4, Oso-5, Ov-1 satellites, Ultraviolet radiation, X ray analysis.

For abstract, see STAR 1219

N74-30258/9GA PC$6.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

INTERPLANTETARY STREAMS AND THEIR INTERACTION WITH THE EARTH.
L. F. Burlaga. Jul 74, 60p NASA-TM-X-70714, X-692-74-216
Subm-Submitted for Publication.

Descriptors: *Earth (Planet), *Interplanetary gas, *Plasma interactions.

For abstract, see STAR 1219

N74-30259/7GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ENERGETIC SOLAR PROTON VERSUS TERRESTRIALLY TRAPPED PROTON FLUXES FOR THE ACTIVE YEARS 1977 - 1983.
J. H. King, and E. G. Stassinopoulos. Jul 74, 15p NASA-TM-X-70716, X-601-74-221

Descriptors: *Proton flux density, *Solar protons, *Trapped particles, Mission planning, Orbits, Statistical analysis.

For abstract, see STAR 1219

N74-30275/3GA PC$4.00/MF$2.25
Florida Univ., Gainesville. Dept. of Physics and Astronomy.
DETECTION AND ANALYSIS OF JUPITER'S DECAMETRIC MICROPULSES.
Final Report, 1 Feb. 1971 - 31 Jan. 1972.
G. R. Lebo. 31 Jan 72, 14p NASA-CR-138589
Contract NGR-10-005-149

Descriptors: *Decimeter waves, *Io, *Jupiter (Planet), *Planetary radiation, *Radio waves, Data acquisition, Electromagnetic radiation, Radiation detectors, Radio astronomy, Test equipment.

For abstract, see STAR 1219

N74-30281/1GA PC$4.00/MF$2.25
Johns Hopkins Univ., Baltimore, Md.
STATISTICAL MODELS OF LUNAR ROCKS AND REGOLITH.
Final Report.
A. H. Marcus. 8 Oct 73, 6p NASA-CR-139314
Contract NGR-21-001-080

Descriptors: *Lunar rocks, *Lunar soil, *Statistical analysis, Computerized simulation, Lithology, Lunar craters, Mathematical models.

For abstract, see STAR 1219

N74-30282/9GA PC$4.00/MF$2.25
Johns Hopkins Univ., Baltimore, Md. Dept. of Mathematical Sciences.
ON THE DEFINITION OF CRATER SATURATION DIAMETER.
A. H. Marcus. Sep 72, 9p NASA-CR-139217, TR-168
Contract NGR-21-001-080

Descriptors: *Density (Number/volume), *Lunar craters, *Planetary surfaces, Apollo 12 flight, Diameters, Meteoroid concentration, Surface roughness.

For abstract, see STAR 1219

N74-30287/8GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE APPLICATION OF TREND SURFACE ANALYSIS TO A PORTION OF THE APOLLO 15 X-RAY FLUORESCENCE DATA.
M. H. Podwysocki, J. R. Weidner, C. G. Andre, A. L. Bickel, and R. S. Lum. May 74, 13p NASA-TM-X-70708, X-682-74-129
Subm-Submitted for Publication. Conf-Presented at Proc. Of the 5TH Lunar Sci. Conf., Houston, Tex., 18-22 Mar. 1974.

Descriptors: *Apollo 15 flight, *X ray analysis, *X ray fluorescence, Albedo, Circular orbits, Lunar maria, Lunar orbits, Lunar surface.

For abstract, see STAR 1219

N74-30288/6GA PC$4.25/MF$2.25
New York Univ., N.Y.
ELECTRON AND ION DENSITIES IN INTERSTELLAR CLOUDS.
A. E. Glassgold, and W. D. Langer. 1974, 29p NASA-CR-138964
Contract NGR-33-016-196

Descriptors: *Electron density (Concentration), *Interstellar gas, *Ion density (Concentration), Helium, Hydrogen, Oxygen, Quantitative analysis.

For abstract, see STAR 1219

N74-30289/4GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
VENUS CLOUD PROPERTIES: INFRARED OPACITY AND MASS MIXING RATIO.
R. E. Samuelson, R. A. Hanel, L. W. Herath, V. G. Kunde, and W. C. Maguire. Jun 74, 51p NASA-TM-X-70713, X-622-74-191
Subm-Submitted for Publication.

Descriptors: *Clouds, *Infrared spectra, *Mariner 5 space probe, *Venus atmosphere, Astronomical models, Mass ratios, Opacity, Sulfuric acid, Wavelengths.

For abstract, see STAR 1219

N74-30291/0GA PC$4.50/MF$2.25
California Inst. of Tech., Pasadena.
HYDROGEN AND FLUORINE IN THE SURFACES OF LUNAR SAMPLES.
D. A. Leich, R. H. Goldberg, D. S. Burnett, and T. A. Tombrello. Apr 74, 30p NASA-CR-139299
Contracts NGR-05-002-333, NSF GP-28027

Descriptors: *Fluorine, *Hydrogen, *Lunar soil, *Pollution, Apollo 17 flight, Ion implantation, Nuclear magnetic resonance, Teflon (Trademark).

For abstract, see STAR 1219

N74-30292/8GA PC$17.50/MF$2.25
Washington Univ., St. Louis, Mo. Lab. for Space Physics.
LUNAR SAMPLE CONTRACTS.
Final Report, 1 Jul. 1968 - 31 Jan. 1971.
R. M. Walker. May 74, 168p NASA-CR-134321
Contracts NAS9-8165

Descriptors: *Lunar rocks, *Particle tracks, Electron microscopes, Thermoluminescence, University program, X ray diffraction.

For abstract, see STAR 1219

N74-30891/7GA PC$6.25/MF$2.25
Lockheed Missiles and Space Co., Sunnyvale, Calif. Lockheed Solar Observatory.
THE SPECTRA SPECTROHELIOGRAPH SYSTEM, SECTION 1.
Final Report.
A. M. Title. May 74, 61p NASA-CR-120376, LMSC-D402244-SECT-1
Contract NAS8-28018

Descriptors: *Mapping, *Solar magnetic field, *Solar spectra, *Spectroheliographs, Densitometers, Fourier transformation, Zeeman effect.

For abstract, see STAR 1220

N74-31283/6GA PC$6.75/MF$2.25
Linguistic Systems, Inc., Cambridge, Mass.

NEW DATA ON COSMIC RAYS.
G. B. Zhdanov. Aug 74, 73p NASA-TT-F-15619
Contract NASW-2482
Tran-Transl. Into English of the Book "Novyye Dannyye O Kosmicheskikh Luchakh" Moscow, Znaniye Press, No. 1, 1974 p 1-64.

Descriptors: *Astrophysics, *Cosmic rays, Galactic radio waves, High energy electrons, Stellar radiation.

For abstract, see STAR 1220

N74-31284/4GA PC$4.00/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
THE SPIRAL INTERPLANETARY MAGNETIC FIELD: A POLARITY AND SUNSPOT CYCLE VARIATION.
L. Svalgaard, and J. M. Wilcox. Jun 74, 11p NASA-CR-139499, SU-IPR-573
Contracts NGR-05-020-559, N00014-67-A-0112-0068
Subm-Submitted for Publication.

Descriptors: *Interplanetary magnetic fields, *Sunspots, Polarity, Solar activity, Spirals.

For abstract, see STAR 1220

N74-31285/1GA PC$4.50/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
SOLAR ROTATING MAGNETIC DIPOLE.
E. Antonucci. Apr 74, 28p NASA-CR-139501, SU-IPR-570
Contracts NGR-05-020-559, N00014-67-A-0112-0068
Subm-Submitted for Publication.

Descriptors: *Interplanetary magnetic fields, *Magnetic dipoles, Polarization characteristics, Solar cycles.

For abstract, see STAR 1220

N74-31286/9GA PC$4.00/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
SOLAR CYCLE VARIATION OF LARGE-SCALE CORONAL STRUCTURES.
E. Antonucci, and T. L. Duvall. Apr 74, 19p NASA-CR-139500, SU-IPR-569
Contracts NGR-05-020-559, N00014-67-A-0112-0068
Subm-Submitted for Publication.

Descriptors: *Interplanetary magnetic fields, *Solar corona, Photosphere, Polarization characteristics, Solar activity.

For abstract, see STAR 1220

N74-31287/7GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
RADIAL GRADIENT OF SOLAR WIND VELOCITY FROM 1 TO 5 AU.
H. R. Collard, and J. H. Wolfe. Jun 74, 17p NASA-TM-X-62372

Descriptors: *Pioneer space probes, *Solar wind velocity, *Velocity measurement, Plasmas (Physics), Satellite-borne instruments, Sun.

For abstract, see STAR 1220

N74-31307/3GA PC$4.50/MF$2.25
Dowling Coll., Oakdale, N.Y.
COMETARY INVESTIGATION DURING THE TOTAL SOLAR ECLIPSE OF 7 MARCH 1970.
Final Report.
H. C. Courten. 30 Nov 71, 26p NASA-CR-139442
Contract NGR-33-181-001

Descriptors: *Comets, *Solar eclipses, Interstellar matter, Photographic equipment.

For abstract, see STAR 1220

N74-31317/2GA PC$4.00/MF$2.25
Maryland Univ., College Park. Space Physics Group.
POST-SHOCK SPIKES: A NEW FEATURE OF PROTON AND ALPHA ENHANCEMENTS ASSOCIATED WITH AN INTERPLANETARY SHOCK WAVE.
G. Gloeckler, F. M. Ipavich, C. Y. Fan, and D. Hovestadt. Jun 74, 17p NASA-CR-139388, TR-74-115
Contracts NAS5-11063, NGR-21-002-224
Subm-Submitted for Publication.

Descriptors: *Alpha particles, *Shock waves, *Spike potentials, Interplanetary magnetic fields, Protons, Trapped particles.

For abstract, see STAR 1220

N74-31318/0GA PC$4.00/MF$2.25
Maryland Univ., College Park. Space Physics Group.
POSSIBLE ACCELERATION OF CHARGED PARTICLES THROUGH THE RECONNECTION OF MAGNETIC FIELD LINES IN INTERPLANETARY SPACE.
E. H. Levy, F. M. Ipavich, and G. Gloeckler. Jun 74, 18p NASA-CR-139387, TR-74-116
Contracts NAS5-11063, NGR-21-002-224
Subm-Submitted for Publication; Sponsored in Part by NSF.

Descriptors: *Charged particles, *Interplanetary magnetic fields, Acceleration (Physics), Alpha particles, Particle motion, Solar wind.

For abstract, see STAR 1220

N74-31319/8GA PC$4.50/MF$2.25
Texas A&M Univ., College Station. Dept. of Physics.
IS THE FOUR-DAY ROTATION OF VENUS ILLUSORY .
A. T. Young. 1974, 30p NASA-CR-139559, REPT-11
Contract NGR-44-001-117
Subm-Submitted for Publication.

Descriptors: *Rotating bodies, *Venus (Planet), Errors, Photometers, Radiometers, Reflection, Sun, Ultraviolet radiation.

For abstract, see STAR 1220

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-785 683/4GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
IONOSPHERIC EFFECTS DURING THE PARTIAL SOLAR ECLIPSE OF 10 JULY 1972,
Haim Soicher, and Francis J. Gorman, Jr. 1971, 8p

Descriptors: *Solar eclipses, *Ionospheric propagation, Satellites(Artificial), Position(Location), Velocity, Electron density, Ionizing radiation, Polarization, New Jersey, Massachusetts, Virginia, Temperature.
Identifiers: Fort Monmouth(New Jersey), Sagamore Hill(Massachusetts), Wallops Island(Virginia), ATS-3 satellite.

A solar eclipse offers a unique opportunity to study the effects of the rapid disappearance and reappearance of solar thermal and ionization radiations on the ionospheric production, loss, and transport processes which affect the total ionospheric number density. Polarization measurements utilizing beacon emissions of the ATS-3 satellite were supplemented with bottomside ionospheric observations made near the subionospheric point during the partial eclipse of 10 Jul 1972. Time variation of the total electron content from 11:00 to 17:30 EST during the eclipse day and during the two days prior to and the three days following it are shown. A comparison of polarization changes during the eclipse day obtained at Fort Monmouth and at Sagamore Hill Radio Observatory, Hamilton, Mass. is given.

AD-785 713/9GA PC$7.50/MF$2.25
Dewey Electronics Corp Paramus N J
AN R AND D EFFORT TO STUDY THE CHEMISTRY OF A DISTURBED IONOSPHERE.
Final technical rept.,
M. N. Hirsh, and K. Raj. Jul 74, 246p BRL-CR-169
Contract DAAD05-71-C-0284

Descriptors: *Ionosphere, *Mass spectroscopy, Ions, Nitrogen oxides, Water vapor, Oxygen, Chemical reactions, Tables(Data).
Identifiers: Hydronium ions.

This report presents a compendium of mass spectrometer measurements of positive and negative ion spectra obtained during the irradiation of air-like gas mixtures by relativistic electrons, under conditions which partially simulate the nighttime disturbed stratosphere. The measurements were performed to provide a data base, obtained under controlled laboratory conditions, for comparison with the predictions of multispecies atmospheric chemistry codes, to test the validity of the codes. Measurements were made at pressures of 1, 2, and Torr, and at 300K, in each of three sample atmospheres, each containing essentially 80% N2, 20% O2, but differing in the concentrations of H2O and CO2. Considerable effort has been devoted to determining the quantitative variation of relative ion currents with the various operating parameters of the mass spectrometer, an rf monopole mass filter, and its associated ion sampling and detection systems. (Modified author abstract)

AD-785 797/2GA Reprint
Pennsylvania State Univ University Park Ionosphere Research Lab
RELATIONS AMONG LOW IONOSPHERE PARAMETERS AND A3 RADIO WAVE ABSORPTION,
J. P. Cipriano, L. C. Hale, and J. D. Mitchell. 20 Feb 74, 8p AROD-10287.6-EN
Grants DA-ARO-31-124-72-G158, NGR-39-009-218
Revision of report dated 23 Aug 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n15 p2260-2265, 20 May 74.

Descriptors: *Ionosphere, Charged particles, Absorption(Physical), Radio waves, Conductivity.

Charged particle conductivities measured in the very low ionosphere are compared with atmospheric parameters and high-frequency radio wave absorption measurements. Between 33 and 58 km, positive conductivity is well correlated with neutral atmospheric temperature. Good correlations are found also between high-frequency radio wave absorption and negative conductivity at altitudes as low as 53 km, this fact suggesting that day-to-day variations in absorption may be principally due to variations in electron loss rate. These correlations do not apply to some days of very low or very high radio wave absorption, for which the effects of transport on nitric oxide appear to be important. (Author)

AD-785 824/4GA PC$5.25/MF$2.25
Stanford Research Inst Menlo Park Calif
A MULTIPULSE CORRELATOR FOR THE CHATANIKA RADAR.
Technical rept. no. 2, Nov 72-Dec 73,
Charles L. Rino, G. Howard Burch, Murray J. Baron, and Odile de la Beaujardiere. Feb 74, 102p DNA-3361T
Contract DNA001-72-C-0076

Descriptors: *Ionosphere, *Radar signals, Correlators, Incoherent scattering, Electron density, Ion density, Data processing, Alaska.
Identifiers: Autocorrelation, E region.

This report describes the theory and operation of a multipulse correlator for the DNA 617 radar now located at Chatanika, Alaska. The hardware correlator is of a novel design that utilizes patch-wire programming to select the particular lags that are to be computed. The unit can deliver as many as 40 8-bit-by-8-bit signed products every 20 micrometers, at any of 48 3-km range gates that are specified under computer control. (Modified author abstract)

AD-785 825/1GA PC$4.25/MF$2.25
Stanford Research Inst Menlo Park Calif
ANALYSIS TECHNIQUES FOR INCOHERENT-SCATTER DATA INTERPRETATION IN THE 100-300 KM REGION.
Technical rept. no. 3, Jan-Dec 73,
Vincent B. Wickwar. Jan 74, 74p DNA-3335T
Contract DNA001-72-C-0076

Descriptors: *Ionosphere, *Temperature, *Radar signals, Electron energy, Electron density, Ion density, Aurorae, Diurnal variations, Power spectra, Curve fitting, Statistical functions, Least squares method, Incoherent scattering, Alaska.
Identifiers: F region.

This report examines the factors involved in the derivation of temperature information from Chatanika radar data by means of a least-squares fitting of theoretical autocorrelation functions (ACF) to the measured ACFs. The combined influence of these factors and the range of possible interpretations is shown for models of the auroral and daytime ionospheres. Finally, an indication is given of what remains to be examined and done to fully implement the least-squares fitting procedure. (Modified author abstract)

AD-785 841/8GA PC$4.75/MF$2.25
Naval Research Lab Washington D C
A NUMERICAL MODEL OF THE MID-LATITUDE IONOSPHERE.
Interim rept.,
E. S. Oran, T. P. Coffey, D. F. Strobel, T. R. Young, Jr., and D. V. Anderson. Jul 74, 97p Rept no. NRL-MR-2839

Descriptors: *Atmosphere models, *Ionosphere, Laminar boundary layer, Turbulence, Instability, Chemical reactions, Ionization, Ion density, Electron density, Electron scattering, Equations of motion, Maxwells equations, Transport properties.
Identifiers: E region, F region.

A description of the theoretical one-dimensional laminar model of the mid-latitude ionosphere developed at NRL is presented. The physics, Chemistry, and approximations that go into the model are described in detail. Radiation deposition and the applicable chemical reactions are discussed, and the multi-fluid equations governing velocities, temperatures, and densities in the ionosphere are reduced to a tractable one-dimensional set of equations with vertical variations. Numerical techniques used in solving the resulting coupled equations are outlined. Finally, preliminary results and future work on model are discussed. (Author)

AD-785 969/7GA PC$3.25/MF$2.25
Chicago Univ Ill Lab for Atmospheric Probing
RADAR MEASUREMENT OF ATMOSPHERIC TURBULENCE.
Final rept.,
R. C. Srivastava. Sep 74, 5p
Contract N00014-67-A-0285-0014
See also AD-724 322.

Descriptors: *Atmospheric motion, *Meteorological radar, Radar equipment, Doppler radar, High resolution, Atmospheric sounding, Continuous waves, Frequency modulation, Radar signals, Statistical analysis.

The work performed under the contract was reported in detail in quarterly reports submitted to the Office of Naval Research. In this report, highlights of the work is given with reference to an attached list of publications. The published work may be classified under the three broad headings: (1) Turbulence measurement by radar; (2) Signal statistics; and (3) High resolution FM-CW radar studies.

AD-786 000/0GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
TOWARD A THEORY OF DISTURBANCE OF THE LOWER IONOSPHERE BY A METAL BODY,
A. A. Yastrebov. 26 Aug 74, 19p Rept no. FTD-HC-23-1863-74
Edited trans. of Tsentralnoi Aerologicheskoi Observatorii, Moscow. Trudy (USSR) n3 p35-43 1972.

Descriptors: *Ionospheric disturbances, *Sounding rockets, Atmospheric sounding, Ionospheric propagation, Charged particles, Translations, USSR.

AD-786 242/8GA Reprint
Rice Univ Houston Tex Dept of Space Physics and Astronomy
THE MOTION AND MAGNETIC STRUCTURE OF THE PLASMA SHEET NEAR 30 (R SUB E).
Special scientific rept.,
S. B. Bowling, and R. A. Wolf. 5 Dec 73, 17p AFCRL-TR-74-0423
Contract F19628-73-C-0120, Grant NGR-44-006-137
Sponsored in part by National Science Foundation, Washington, D.C. Grant GA-27206.
Availability: Pub. in Jnl. of Planetary and Space Science, v22 p673-686 Jul 74.

Descriptors: *Magnetosphere, Geomagnetism, Magnetic properties, Currents, Magnetic fields, Graphs.
Identifiers: Explorer 34 satellite, *Magnetotail.

The plasma sheet plays a vital role in the dynamics of the Earth's magnetotail. However, the mixing of temporal and spatial effects observed by a single satellite causes difficulty in correlating predictions of theoretical models with the interpretation of experimental data. In this paper, statistical techniques are used to separate temporal and spatial effects, to obtain detailed information about the magnetic structure of the central plasma sheet, and to estimate the flapping amplitude and velocity of the plasma sheet.

COM-74-50087-360/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
IONOSPHERIC DATA.
Aug 74, 132p NOAA-FA-360 NOAA-74090303
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. $10.00/year, $1.00/copy.

Descriptors: *Ionosphere, Statistical data, Tables(Data), Sunspots, Ionospheric disturbances, Ionospheric propagation, Electron density(Concentration), Atmospheric sounding, Wallops Island.

The publication contains monthly medians for the same month the publication is issued. For example, the January 1973 issue includes all the data available for January 1973 and any previous unpublished data for January from earlier years. Also published are detailed data for the same month from an exemplary station, Wallops Island (Washington) including daily-hourly values of all characteristics, f-plots for Regular World Days, and an N(h) contour graph. As timely information, there is included selected ionospheric data for a Retrospective World Interval, when appropriate. Also given is information on ionospheric data recently received at World Data Center A for Solar-Terrestrial Physics and other information on availability of data from the WDC's. This issue also contains tables and graphs of monthly median ionospheric data for August 1957 and each August to that of 1973.

COM-74-50864/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
BREMSSTRAHLUNG IN THE ATMOSPHERE AT SATELLITE ALTITUDES.
Final rept.,
S. M. Seltzer, and M. J. Berger. 1974, 5p
Sponsored in part by National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center and Office of Naval Research, Arlington, Va.
Pub. in Jnl. of Atmospheric and Terrestrial Physics, v36 p1283-1287 1974.

Descriptors: *Earth atmosphere, *Electron beams, *Bremsstrahlung.

Transport calculations have been made to determine the emission of bremsstrahlung by electrons in the atmosphere and the penetration of this radiation to high altitudes where it can be detected by satellite-borne instruments. The calculations were done assuming uniform wide-area precipitation into the atmosphere of an electron flux isotropic over the downward hemisphere. The intensity and energy spectrum of the bremsstrahlung have been obtained for the case of incident monoenergetic electron beams at energies between 20 keV and 2 MeV, for incident electron beams with exponential spectra with e-folding energies between 5 keV and 200 keV.

N74-29703/7GA PC$18.75/MF$2.25
Allied Research Associates, Inc., Baltimore, Md.
THE NIMBUS 5 DATA CATALOG. VOLUME 1: DATA ORBITS 104 THROUGH 693, 19 DECEMBER 1972 - 31 JANUARY 1973.
May 73, 312p NASA-CR-139036
Contract NASS-21617

Descriptors: *Meteorological parameters, *Nimbus 5 satellite, *Radiometers, Catalogs (Publications), Cloud photography, Infrared scanners, Microwave radiometers, Temperature profiles.

For abstract, see STAR 1219

N74-29704/5GA PC$7.75/MF$2.25
Tennessee Univ., Knoxville. Civil Engineering Dept.
EFFECTS OF ATMOSPHERIC AEROSOLS ON SCATTERING REFLECTED VISIBLE LIGHT FROM EARTH RESOURCE FEATURES.
Final Report.
K. E. Noll, B. A. Tschantz, and W. T. Davis. 31 Dec 72, 92p NASA-CR-139382
Contract NGL-43-001-021

Descriptors: *Aerosols, *Light (Visible radiation), *Reflection, Earth resources, Light scattering.

For abstract, see STAR 1219

N74-29707/8GA PC$12.50/MF$2.25
Instituto de Pesquisas Espaciais, Sao Jose dos Campos (Brazil).
EXCITATION MECHANISM FOR TROPICAL EMISSIONS OF ATOMIC OXYGEN.
M.S. Thesis.
J. A. Bittencourt. Jan 72, 186p INPE-226-LAFE

Descriptors: *Airglow, *Atomic excitations, *Emission spectra, *Oxygen spectra, *Tropical regions, Atmospheric models, Electron density profiles, Electron transitions, Exosphere, Ion recombination, Ionograms, Radiative recombination, Thermosphere.

For abstract, see STAR 1219

N74-29710/2GA PC$4.75/MF$2.25
Weapons Research Establishment, Salisbury (Australia).
THE FEASIBILITY OF THE FALLING SPHERE AS A SOUNDING TECHNIQUE FOR THE LOWER ATMOSPHERE.
S. G. Johnson. Jun 74, 31p WRE-TN-1211(WR/D)

Descriptors: *Ionospheric sounding, *Spheres, Descent trajectories, Falling, Meteorological parameters.

For abstract, see STAR 1219

N74-29714/4GA PC$12.50/MF$2.25
Stanford Univ., Calif. Electronics Labs.
AN OCCULTATION SATELLITE SYSTEM FOR DETERMINING PRESSURE LEVELS IN THE ATMOSPHERE.
A. R. Morrison, S. G. Vngar, and B. B. Lusignan. 1974, 189p NASA-CR-132436
Contracts NAS1-9962, NAS1-9963

Descriptors: *Atmospheric pressure, *Occultation, *Pressure sensors, *Satellite instruments, Defocusing, Ground tests, Infrared detectors, Meteorological satellites, Microwave sensors, Signal fading, Temperature profiles.

For abstract, see STAR 1219

N74-29715/1GA PC$11.25/MF$2.25
Hawaii Univ., Honolulu.
CATALOG OF DATA SUMMARY OF AIRGLOW OBSERVATIONS OBTAINED AT HALEAKALA, HAWAII.
Final Report.
W. R. Steiger, and L. L. Smith. 1974, 163p NASA-CR-139376
Contract NGR-12-001-001

Descriptors: *Airglow, *Hawaii, *Tables (Data), Catalogs (Publications), Photometers, Photomultiplier tubes.

For abstract, see STAR 1219

N74-29716/9GA PC$13.00/MF$2.25
Hawaii Univ., Honolulu.
ATLAS OF ZENITH AIRGLOW PLOTS OBTAINED AT HALEAKALA, HAWAII. VOLUME 1: JULY 1961 TO DECEMBER 1964.
Final Report.
W. R. Steiger, and L. L. Smith. 1974, 200p NASA-CR-139377
Contract NGR-12-001-001

Descriptors: *Airglow, *Graphs (Charts), *Hawaii, Catalogs (Publications), Milky way galaxy, Zenith.

For abstract, see STAR 1219

N74-29717/7GA PC$13.00/MF$2.25
Hawaii Univ., Honolulu.
ATLAS OF ZENITH AIRGLOW PLOTS OBTAINED AT HALEAKALA, HAWAII. VOLUME 2: JANUARY 1965 TO JANUARY 1969.
Final Report.
W. R. Steiger, and L. L. Smith. 1974, 197p NASA-CR-139378
Contract NGR-12-001-001

Descriptors: *Airglow, *Graphs (Charts), *Hawaii, Catalogs (Publications), Milky way galaxy, Zenith.

For abstract, see STAR 1219

N74-29719/3GA PC$7.50/MF$2.25
Ionospharen-Institut Breisach (West Germany).
ABSORPTIONS DATA: FREIBURG, URSI-CODE 131, JULY - SEPTEMBER 1972 ABOSORPTIONS-DATEN: FREIBURG, URSI-CODE 131, JULI - SEPTEMBER 1977.
Sep 72, 87p

Descriptors: *Ionospheric propagation, *Ionospheric sounding, Diurnal variations, E region, Electromagnetic absorption, F region, Tables (Data).

For abstract, see STAR 1219

N74-29729/2GA PC$4.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE RELATION OF VARIATIONS IN TOTAL MAGNETIC FIELD AT HIGH LATITUDE WITH THE PARAMETERS OF THE INTERPLANETARY MAGNETIC FIELD AND WITH DP2 FLUCTUATIONS.
R. A. Langel. Jun 74, 34p NASA-TM-X-70711, X-922-74-189
Subm-Submitted for Publication.

Descriptors: *Interplanetary magnetic fields, *Ogo-c, *Ogo-3, *Ogo-4, Magnetic disturbances, Satellite observation.

For abstract, see STAR 1219

N74-29735/9GA PC$5.25/MF$2.25
Pennsylvania State Univ., University Park. Ionosphere Research Lab.
IONOSONDE UNDERLYING IONIZATION CORRECTION USING IONOSPHERIC MODELS.
D. F. Ferriola. 3 Jul 74, 42p NASA-CR-139213, SR-425E
Contracts NGL-39-009-003, N00014-67-A-0385-00-17

Descriptors: *Atmospheric models, *Ionosondes, *Ionospheric sounding, Electron density profiles, Ionization, Ionograms.

For abstract, see STAR 1219

N74-29951/2GA PC$6.00/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
LIDAR MEASUREMENTS OF THE VARIABILITY OF STRATOSPHERIC PARTICULATES.
Semiannual Report.
P. B. Russell, W. Viezee, and R. D. Hake. Jul 73, 56p NASA-CR-139273
Contracts NAS2-7261, SRI PROJ. 2217
Subm-Sponsored in Part by DOT.

Descriptors: *Air pollution, *Optical radar, Aerosols, Atmospheric scattering, Pulsed lasers, Ruby lasers.

For abstract, see STAR 1219

N74-30161/5GA PC$5.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
PLASMA INSTABILITIES AND MODEL RADIO AURORA.
A. V. Volosevich, V. A. Liperovskiy, and Y. L. Sverdlov. Jul 74, 49p NASA-TT-F-15675, PREPRINT-153
Contract NASW-2483
Tran-Transl. Into English of "Plazmennye Neustoychivosti I Model' Radioavrory" Moscow, USSR Acad. Of Sci., Preprint No. 153, 1974 47 p.

Descriptors: *Ionospheric disturbances, *Plasma-electromagnetic interaction, *Radio auroras, Atmospheric models, Ionospheric propagation, Polar regions, Radio echoes.

For abstract, see STAR 1219

N74-30162/3GA PC$4.25/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
THEORETICAL AND EXPERIMENTAL STUDIES OF SPACE-RELATED PLASMA WAVE PROPAGATION AND RESONANCE PHENOMENA.
Semiannual Report, 1 Jan. - 30 Jun. 1974.
F. W. Crawford. Jul 74, 25p NASA-CR-139275, SU-IPR-580
Contract NGL-05-020-176

Descriptors: *Ionospheric propagation, *Plasma resonance, *Plasma waves, Magnetohydrodynamic waves, Plasma-electromagnetic interaction, Research projects, Whistlers.

For abstract, see STAR 1219

N74-30260/5GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECT OF POLLUTANT GASES ON OZONE PRODUCTION BY SIMULATED SOLAR RADIATION.
E. L. Wong, and D. A. Bittker. 1974, 30p NASA-TM-X-71573, E-8013
Conf-Presented at 2D Intern, Conf. On the Environ. Impact of Aerospace Operations in the High Atmosphere, San Diego, Calif., 8-10 Jul. 1974; Sponsored by AM. Meteorol. Soc. And the Aiaa.

Descriptors: *Contaminants, *Ozone, *Solar radiation, Carbon monoxide, Emission, Hydrocarbons, Nitric oxide, Nitrogen dioxide, Upper atmosphere.

For abstract, see STAR 1219

N74-30278/7GA PC$4.00/MF$2.25
Rice Univ., Houston, Tex. Dept. of Space Physics and Astronomy.
OBSERVATIONS OF LOW-ENERGY ELECTRONS UPSTREAM OF THE EARTH'S BOW SHOCK.
D. L. Reasoner. Aug 74, 17p NASA-CR-138309
Grant NSG-07025

Descriptors: *Bow waves, *Electrons, *Flux (Rate), *Shock waves, Charged particles, Interplanetary magnetic fields, Solar wind.

For abstract, see STAR 1219

N74-30286/0GA PC$5.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
RECENT ADVANCES IN SATELLITE OBSERVATIONS OF SOLAR VARIABILITY AND GLOBAL ATMOSPHERIC OZONE.
D. F. Heath. Jun 74, 44p NASA-TM-X-70712, X-912-74-190

Descriptors: *Ozone, *Satellite observation, Backscattering, Nimbus 4 satellite, Solar radiation, Ultraviolet spectra.

For abstract, see STAR 1219

N74-30840/4GA PC$4.00/MF$2.25
Old Dominion Univ. Research Foundation, Norfolk, Va.
A STUDY OF STRATOSPHERIC GASES CATALYTICALLY REACTING ON ALUMINA.
Final Report.
J. L. Cox, Jr.. Aug 74, 7p NASA-CR-139563
Contract NGR-47-003-077

Descriptors: *Aluminum oxides, *Catalytic activity, *Gas dynamics, *Stratosphere, Chemical reactions, Vacuum apparatus.

For abstract, see STAR 1220

N74-30841/2GA PC$5.75/MF$2.25
Linguistic Systems, Inc., Cambridge, Mass.
HEAT TRANSFER IN THE ATMOSPHERE.
Y. M. Feygelson, and L. R. Tsvang. Jul 74, 210p NASA-TT-F-790
Contract NASW-2482
Tran-Transl. Into English of the Book "Teploobmen V Atmosfere" Moscow, Nauka Press, 1972 p 1-147.

Descriptors: *Heat transfer, *Troposphere, Boundary layers, Cloud cover, Heat flux, Weather forecasting.

For abstract, see STAR 1220

N74-31115/0GA PC$4.00/MF$2.25
Cleveland State Univ., Ohio.
DEVELOPMENT OF A GLOBAL POLLUTION MODEL FOR CO, CH4, AND CH2O.
Final Report, 1 May - 14 Aug. 1974.
L. K. Peters. 14 Aug 74, 16p NASA-CR-139484
Grant NSG-1030

Descriptors: *Air pollution, *Atmospheric models, Carbon monoxide, Chemical reactions, Formaldehyde, Methane, Troposphere.

For abstract, see STAR 1220

UCID-16559 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
EFFECT OF STRATOSPHERIC AEROSOL ON LONGWAVE RADIATIVE FLUXES: VARIATION WITH LATITUDE AND SEASON.
F. M. Luther. 19 Jul 74, 8p
Contract W-7405-eng-48

Descriptors: (*Long wave radiation, *Seasonal variations), Aerosols, Aircraft, Climates, Environmental effects, Latitude effect, Space vehicles, Stratosphere.

For abstract, see NSA 30 08, number 23489.

4B. Meteorology

AD-785 664/4GA PC$3.25/MF$2.25
Army Electronics Command White Sands Missile Range N Mex Atmospheric Sciences Lab
OPTICAL TECHNIQUES FOR THE MEASUREMENT OF CROSSWINDS.
Thomas H. Pries, Erick T. Young, and Jack Smith. 1973, 14p

Descriptors: *Atmospheric motion, *Optical detection, *Artillery fire, Lasers, Turbulence, Detectors, Laser beams, Armored vehicles, Corrections, Army operations, Guided missile ranges, New Mexico.
Identifiers: Remote sensing.

The need for accurate horizontal surface crosswind information to support direct artillery fire delivered by armored vehicles is well established. A path-integrated crosswind accurate to plus or minus 0.5 m/s (plus or minus 1 knot) is a requirement that is not met with current Army capabilities (1). The most advantageous means of obtaining this quantity would be some remote sensing technique. The paper discusses systems being investigated by the Atmospheric Sciences Laboratory, US Army Electronics Command, White Sands Missile Range, New Mexico, for use in the field Army.

AD-785 718/8GA Reprint
Louisiana State Univ Baton Rouge Coastal Studies Inst
EXPERIMENTAL RESULTS OF THE DRAG-COEFFICIENT ESTIMATION FOR AIR-COAST INTERFACES.
Technical rept.,
Shih-Ang Hsu. 30 Aug 73, 7p Rept no. TR-169
Contract N00014-69-A-0211-0003
Availability: Pub. in Boundary-Layer Meteorology, v6 p505-507 May/Jun 74.

Descriptors: *Coastal regions, *Wind, *Beaches, Turbulence, Interactions, Shear stresses, Interfaces.
Identifiers: Atmospheric boundary layer.

Field experiments on the turbulent transfer of momentum in the atmospheric surface boundary

layer were conducted on various beaches ranging from tropical to arctic. From these measurements the wind-stress drag coefficient for a given air-coast interface was computed and summarized. (Author)

AD-785 741/0GA PC$3.75/MF$2.25
Drexel Univ Philadelphia Pa Dept of Physics and Atmospheric Sciences
MEASUREMENT OF ATMOSPHERIC TEMPERATURE PROFILES.
Final rept. no. 1,
John A. Cooney. Aug 74, 33p AROD-11171.1-EN
Grants DA-ARO-D-31-124-73-G166, DAHC04-74-G-0157
See also report dated 6 Oct 71, AD-751 871.

Descriptors: *Atmospheric temperature, Measurement, Nitrogen, Raman spectroscopy, Oxygen, Radiosondes, Correlation techniques, Optical radar.
Identifiers: Temperature profiles.

The equilibrium distribution of atmospheric N2 and O2 among their possible molecular rotational states is a very precise measure of the gas temperature. Hence the rotational spectrum can provide a faithful measure of temperature. By monitoring separate portions of the Raman rotational state, a pair of signals generated simultaneously can be differenced (or their logarithms can be differenced) and the difference signal is a measure of the temperature. Raman lidar was used in this fashion to generate such signals in a prototype experiment. While time and funds were insufficient to develop the electronic processing to the required sensitivity, measurements of such temperature profiles have been made and compared to temperature profiles as measured by radiosonde. Tight space and moderate time correlation were maintained for the comparison of the two types of temperature profiles. (Author)

AD-785 855/8GA PC$5.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
THE SEASONAL DENSITY STRUCTURE AND CIRCULATION ON THE CONTINENTAL SHELF.
Doctoral thesis,
Donald Ray Johnson. Mar 73, 116p
Contract N00014-67-A-0201-0013

Descriptors: *Atmospheric circulation, *Continental shelves, *Air water interactions, Interfaces, Friction, Cooling, Patterns, Computerized simulation, Mathematical models, Convection(Atmospheric), Theses, Tidal currents, New York, Florida, Correlation techniques.
Identifiers: Cape Canaveral.

A computer simulation model is used to study the gross seasonal density structure and circulation patterns in waters over the continental shelf. The model consists of a non-linear, time-dependent, two-layer ocean on an f-plane with friction and varying bottom topography. Stirring on both sides of the interface and the resulting entrainments produce a density flux between layers which, together with surface cooling, tends to reduce stratification. Seasonal heating, along with secondary, cross-shelf circulation patterns, tends to restore stratification. A comparison is made with BT-sections across the continental shelves off Cape Canaveral and off New York. (Modified author abstract)

AD-785 891/3GA PC$8.50/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1966.
Annual rept. Jan-Dec 66.
1966, 262p
See also report dated 1967, AD-785 344.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Radar tracking, Aerial reconnaissance, Statistical data, Tropical cyclones, Meteorological satellites, Errors, Meteorological radar.
Identifiers: North Pacific Ocean, Storm tracks, Eye of the storm.

Annual publication summarizing tropical cyclone activity in the western North Pacific. Includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. Also includes a summary of tropical cyclone activity in the eastern North Pacific. (Author)

AD-786 014/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
DISTRIBUTION OF DURATION AND INTENSITY OF PRECIPITATION IN THE USSR,
O. G. Sorochan, I. A. Aframeeva, A. G. Mersiyanova, and I. A. Fedotova. 15 Apr 74, 18p
Rept no. FSTC-HT-23-0416-74
Trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n266 p168-178 1970.

Descriptors: *Atmospheric precipitation, *USSR, Distribution, Rainfall intensity, Periodic variations, Volume, Meteorological charts, Real time, Translations.

A study of distribution and duration of intensity of precipitation in the USSR shows that the average intensity is small. Precipitation over the European territory of the Soviet Union is more intense than over the Asiatic territory of the USSR, with a few exceptions. Maps are given which help to show the data on various time intervals throughout the year. (Modified author abstract)

AD-786 107/3GA PC$3.75/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
TECHNIQUES FOR CALCULATING THE CORRELATION FUNCTIONS AND SPECTRA OF METEOROLOGICAL TIME SERIES,
K. Ya. Vinnikov, N. K. Grib, and I. I. Polyak. 26 Jul 74, 31p Rept no. FTD-HC-23-2163-74
Edited trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n308 p27-46 1973.

Descriptors: *Meteorological phenomena, *Time series analysis, Signal processing, Fourier transformation, Translations, USSR.

AD-786 109/9GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
REPRESENTATION OF CERTAIN TIME HARMONICS OF GEOPOTENTIAL AND VELOCITY BY MEANS OF ELLIPTICAL WEIERSTRASS FUNCTIONS IN THE MODEL OF AN EQUIVALENT-BAROTROPIC LEVEL OF THE ATMOSPHERE,
V. A. Snegerev. 10 Sep 74, 17p Rept no. FTD-HC-23-2096-74
Edited trans. of Gidrometeorologicheskii Nauchno-Issledovatelskii Tsentr SSSR. Trudy, n104 p32-41 1972.

Descriptors: *Atmospheric motion, Transcendental functions, Approximation, Translations, USSR, Geopotential.
Identifiers: Weierstrass theorem.

AD-786 128/9GA PC$9.25/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1962.
Rept. for Jan-Dec 62.
1962, 306p
See also report dated 1966, AD-785 891.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Radar tracking, Statistical data, Aerial reconnaissance, Tropical cyclones, Warning systems, Meteorological radar, Damage, Meteorological charts, Wind velocity, Vortices.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet weather control.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. (Modified author abstract)

AD-786 137/0GA PC$9.50/MF$2.25
National Environmental Satellite Center Washington D C
APPLICATION OF METEOROLOGICAL SATELLITE DATA IN ANALYSIS AND FORECASTING.
Technical rept.,
Ralph K. Anderson, Golden R. Farr, Jerome P. Ashman, Arthur H. Smith, and Leo F. Ritter. Mar 74, 338p Rept no. NESC-51
Also available as Rept. no. AWS-212. Supplement to AD-740 017. Supersedes AD-697 033.

Descriptors: *Weather forecasting, *Cloud cover, *Meteorological satellites, Photointerpretation, Infrared radiation, Radiometers, Cirrus clouds, Cumulus clouds, Television equipment, Infrared images, Aerial photography, Data processing, Spaceborne, Meteorological data, Tropical regions.
Identifiers: FAMOS project, Numerical weather forecasting, Spaceborne photography, ESSA satellites.

The report represents the combined efforts of personnel of the Applications Group, National Environmental Satellite Center (NESC), now the National Environmental Satellite Service (NESS); the NAVAL AIR SYSTEMS COMMAND Project FAMOS; and the Satellite Section, USAF ENVIRONMENTAL TECHNICAL APPLICATIONS CENTER (ETAC). Topics discussed include the following: Satellite cloud atlas and glossary; Synoptic cloud patterns; Application of satellite data to synoptic analysis in the tropics; Local phenomena; Infrared.

AD-786 147/9GA PC$7.00/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1959.
Rept. for Jan-Dec 59.
1959, 194p
See also report dated 1960, AD-786 148.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Tropical cyclones, Statistical data, Radar tracking, Aerial reconnaissance, Warning systems, Meteorological satellites, Meteorological radar, Seasonal variations, Meteorological charts.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet Weather central.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. (Modified author abstract)

AD-786 148/7GA PC$7.50/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1960.
Rept. for Jan-Dec 60.
1960, 226p
See also report dated 1959, AD-786 149.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Tropical cyclones, Statistical data, Radar tracking, Aerial reconnaissance, Warning systems, Meteorological satellites, Meteorological radar, Seasonal variations, Meteorological charts.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet weather central.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. (Modified author abstract)

AD-786 149/5GA PC$8.50/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1961.
Rept. for Jan-Dec 61.
1961, 253p
See also report dated 1960, AD-786 148.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Tropical cyclones, Statistical data, Radar tracking, Aerial reconnaissance, Warning systems, Meteorological satellites, Meteorological radar, Seasonal variations, Meteorological charts.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet weather central.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. (Modified author abstract)

AD-786 208/9GA PC$7.25/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1963.
Rept. for Jan-Dec 63.
1963, 210p
See also report dated 1965, AD-786 209.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Tropical cyclones, Statistical data, Radar tracking, Aerial reconnaissance, Warning systems, Meteorological satellites, Meteorological radar, Seasonal variations, Meteorological charts.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet weather central.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. (Modified author abstract)

AD-786 209/7GA PC$8.50/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1964.
Rept. for Jan-Dec 64.
1974, 253p
See also report dated 1965, AD-786 210.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Tropical cyclones, Statistical data, Radar tracking, Aerial reconnaissance, Warning systems, Meteorological satellites, Meteorological radar, Seasonal variations, Meteorological charts.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet weather central.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. (Modified author abstract)

AD-786 210/5GA PC$8.50/MF$2.25
Fleet Weather Central/Joint Typhoon Warning Center Fpo San Francisco 96630
ANNUAL TYPHOON REPORT 1965.
Rept. for Jan-Dec 65.
1965, 255p
See also report dated 1967, AD-785 344.

Descriptors: *Typhoons, *Weather forecasting, *Pacific Ocean, Tropical cyclones, Statistical data, Radar tracking, Aerial reconnaissance, Warning systems, Meteorological satellites, Meteorological radar, Seasonal variations, Meteorological charts.
Identifiers: *North Pacific Ocean, Storm tracks, Fleet weather central.

The annual publication discusses tropical cyclone activity in the western North Pacific. It includes narrative and statistical information on each typhoon including reconnaissance data, best track positions, and forecast verification data. Operational procedures, forecasting techniques, and research efforts of the JTWC are discussed. Also included is a summary of tropical cyclone activity in the eastern North Pacific. (Modified author abstract)

BNWL-SA-5031 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
EXPERIMENTAL IN-CLOUD SCAVENGING STUDIES AT BATTELLE-NORTHWEST.
J. M. Hales. 1974, 2p CONF-740635-1

Descriptors: (*Clouds, Washout), (*Washout, *Tracer techniques), Activation analysis, Earth atmosphere, Meteorology, Sampling.

For abstract, see NSA 30 08, number 21154.

BNWL-1640 PC$5.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
HANFORD WIND STORM OF JANUARY 11, 1972.
Feb 72, 40p
Contract AT(45-1)-1830

Descriptors: (*Washington, *Wind), Data, Hapo, Meteorology, Turbulence, Weather.

For abstract, see NSA 30 08, number 21171.

COM-74-11470/3GA PC$4.25/MF$2.25
National Oceanic and Atmospheric Administration, Idaho Falls, Idaho. Air Resources Labs.
PROGRAM DESCRIPTIONS. SUPPLEMENT TO MESOSCALE WIND FIELDS AND TRANSPORT ESTIMATES DETERMINED FROM A NETWORK OF WIND TOWERS.
Technical memo.,
L. L. Wendell. May 74, 55p NOAA-TM-ERL-ARL-43 NOAA-74080605
Sponsored in part by Atomic Energy Commission, Washington, D.C.

Descriptors: *Wind(Meteorology), *Computer programs, Data processing, Subroutines.
Identifiers: Computer graphics.

A computer program was developed to analyze objectively two-dimensional wind data from a mesoscale network of stations. The result is a graphic display of the network wind field at any particular time and a plot of computed air trajectories as a function of time and point of origin. A brief description, a list of input variables, and program listings for the computer program are provided.

COM-74-11554/4GA PC$5.25/MF$2.25
National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.
OPTIMIZING THE MEASUREMENT OF CONVECTIVE RAINFALL IN FLORIDA.
Technical memo.,
William L. Woodley, Anthony Olsen, Alan Herndon, and Victor Wiggert. Jul 74, 106p NOAA-TM-ERL-WMPO-18 NOAA-74082008
Prepared in cooperation with National Oceanic and Atmospheric Administration, Coral Gables, Fla. Experimental Meteorology Lab.

Descriptors: *Rainfall, *Cloud seeding, Precipitation(Meteorology), Convection, Meteorological radar, Rain gages, Accuracy, Measurement, Florida.

The paper represents the completion of a three-year study of the nature of Florida convective rainfall and its measurement. The report has five major sections: (1) Definition of the nature of Florida convective rains to serve as a basis for determining the magnitude of the measurement problem, (2) calculation of area-mean rainfall using gages deployed over an area of 220 sq. miles, errors are determined as a function of gage density, (3) estimation of area rainfall using S-band radar with gages in small, dense arrays serving as the basis for comparison, (4) definition of the gaging requirements to measure area-mean rainfall within a specified accuracy over large areas using gages, and (5) specification of the accuracy of a combined gage and radar system for the measurement of areal convective precipitation. The results presented are pertinent to the evaluation of EML's seeding experiments.

COM-74-11555/1GA PC$3.25/MF$2.25
National Weather Service, Salt Lake City, Utah. Western Region.
CONDITIONAL PROBABILITY OF VISIBILITY LESS THAN ONE-HALF MILE IN RADIATION FOG AT FRESNO, CALIFORNIA.
Technical memo.,
John D. Thomas. Aug 74, 19p NOAA-TM-NWS-WR-94 NOAA-74082006

Descriptors: *Fog, *Visibility, *Weather forecasting, Meteorological data, Probability theory, Meteorological charts, Temperature measurement, Frequency distribution, California.

Probability charts were developed to determine the probability of fog at Fresno, California, during nighttime hours based upon afternoon dry-bulb and dew-point temperatures under radiation conditions. Seven charts are included along with tables showing frequency distributions and verification scores.

COO-2195-11 PC$9.50/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Meteorology.
DIAGNOSTIC STUDIES OF THE GENERAL CIRCULATION OF THE STRATOSPHERE. SCIENTIFIC REPORT NO. 1.
R. E. Newell, G. F. Herman, J. W. Fullmer, W. R. Tahnk, and M. Tanaka. 1974, 126p CONF-740106-6
Contract AT(11-1)-2195

Descriptors: Distribution, Gas flow, Heating, Meteorology, Stratosphere, Temperature measurement, Troposphere, Wind.

For abstract, see NSA 30 08, number 23441.

N74-30047/6GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SURFACE ATMOSPHERIC EXTREMES (LAUNCH AND TRANSPORTATION AREAS).
Jun 74, 77p NASA-SP-8084

Descriptors: *Atmospherics, *Launching sites, *Meteorology, Atmospheric electricity, Atmospheric moisture, Atmospheric pressure, Atmospheric temperature, Solar radiation.

For abstract, see STAR 1219

N74-30052/6GA PC$12.75/MF$2.25
Danish Meteorological Inst., Copenhagen.
METEOROLOGICAL YEARBOOK. PART 1: DENMARK AND FAROE ISLANDS (EXCEPT GREENLAND), 1969.
1974, 193p ISBN-87-7478-092-1
In English and Danish.

Descriptors: *Climatology, *Denmark, *Meteorological parameters, Atmospheric pressure, Atmospheric temperature, Cloud cover, Precipitation (Meteorology), Tables (Data), Wind (Meteorology).

For abstract, see STAR 1219

N74-30053/4GA PC$5.50/MF$2.25
Environmental Research and Technology, Inc., Lexington, Mass.
STUDIES IN THE USE OF CLOUD TYPE STATISTICS IN MISSION SIMULATION.
D. T. Chang, J. H. Willand, D. T. Chang, and J. L. Cogan. Jul 74, 182p NASA-CR-129030
Contract NAS8-28721

Descriptors: *Clouds (Meteorology), *Mission planning, *Statistical analysis, Atmospheric models, Cloud cover, Computer programs, Remote sensors.

For abstract, see STAR 1219

N74-30054/2GA PC$4.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
SYNOPTIC AEROLOGICAL CONDITIONS FOR THE OCCURRENCE OF CLEAR AIR TURBULENCE.
F. Weber. Jul 74, 29p NASA-TT-F-15794, DLR-MITT-70-12
Contract NASW-2483
Tran-Transl. Into English from Meeting of the Dglr Sci. Comm. And Flight Performance and Flight Characteristics (Darmstadt), 12-13 Nov. 1970, Dlr-Mitt-70-12 p 29-54.

Descriptors: *Clear air turbulence, *Meteorological parameters, Atlantic ocean, Europe, Synoptic meteorology, Weather forecasting.

For abstract, see STAR 1219

N74-30313/2GA PC$5.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
AN ANALYSIS OF THE VENERA 8 MEASUREMENTS.
J. E. Ainsworth, and J. R. Herman. Feb 74, 38p
NASA-TM-X-70706, X-623-74-37

Descriptors: *Satellite observation, *Venera 8 satellite, Earth satellites, Infrared radiation, Topography, Venera 7 satellite, Venus (Planet), Wind velocity.

For abstract, see STAR 1219

N74-30598/8GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CVT/GPL PHASE 2 INTEGRATED TESTING.
R. E. Shurney, G. Maybee, and S. Schmitt. 5 Apr 74, 59p NASA-TM-X-64861

Descriptors: *Astrophysics, *Materials science, *Research facilities, Cloud physics, Cosmic rays, Ionospheric disturbances, Liquid helium, Superfluidity.

For abstract, see STAR 1220

N74-31081/4GA PC$5.50/MF$2.25
Hosei Univ., Tokyo (Japan). Dept. of Geography.
STUDIES ON BORA (3).
Climatological Notes No. 15.
1973, 50p

Descriptors: *Meteorological parameters, *Wind (Meteorology), *Yugoslavia, Anticyclones, Meteorological charts, Synoptic meteorology, Tables (Data), Wind direction, Wind measurement, Wind velocity.

For abstract, see STAR 1220

N74-31084/8GA PC$5.25/MF$2.25
Hosei Univ., Tokyo (Japan). Dept. of Geography.
STUDIES ON BORA (2).
Climatological Notes No. 14.
1973, 41p

Descriptors: *Weather forecasting, *Wind (Meteorology), Japan, Meteorological parameters, Topography, Yugoslavia.

For abstract, see STAR 1220

N74-31094/7GA PC$4.00/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
THE SIGNIFICANCE OF TURBULENCE MODELS FOR THE CALCULATION OF THE DISPERSION OF BALLISTIC ROCKETS.
B. Weissenbach. Jul 74, 13p NASA-TT-F-15798, DLR-MITT-70-12
Contract NASW-2483
Tran-Transl. Into English from Meeting of the Dglr Sci. Comm. On Flight Performance and Flight Characteristics (Darmstadt), 12-13 Nov. 1970, Dlr-Mitt-70-12 p 87-97.

Descriptors: *Atmospheric turbulence, *Ballistics, *Projectiles, Aerodynamic forces, Atmospheric models, High altitude, Low altitude, Wind (Meteorology).

For abstract, see STAR 1220

N74-31308/1GA PC$5.00/MF$2.25
Joint Publications Research Service, Arlington, Va.
THE MOON AS A SPACE SCIENTIFIC STATION.
Aug 74, 38p NASA-TT-F-15775
NASA ORDER W-13183
Tran-Transl. Into English from the Book "Sedmoy Kontinent" Moscow, Mosk. Rabochiy, 1973 p 225-274.

Descriptors: *Moon, *Space communication, *Weather forecasting, Earth atmosphere, Interferometers, Lasers, X ray telescopes.

For abstract, see STAR 1220

UCID-16565 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
FINAL REPORT ON ENVIRONMENTAL DEFINITION PROGRAM FOR PERIOD ENDING JUNE 30, 1974.
J. B. Knox, and J. E. Lovill. 25 Jul 74, 12p
Contract W-7405-Eng-48

Descriptors: (*Lawrence livermore laboratory, *Meteorology), Clouds, Satellites, Stratosphere, Temperature monitoring, Troposphere, Water vapor.

For abstract, see NSA 30 08, number 21179.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-785 957/2GA PC$5.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
ANALYSIS OF STRATEGY AND TACTICS EMPLOYED IN CONTRACT NEGOTIATIONS.
Master's thesis,
Harvey A. Marshall, and Robert J. Pratt. Aug 74, 136p Rept no. SLSR-29-74B

Descriptors: *Contracts, *Bargaining, Procurement, Agreements, Strategy, Management, Planning, Air Force, Supervisors, Mathematical models, Theses.
Identifiers: *Negotiations, *Contract administration.

The study conducted in exploration into the awareness and agreement among procurement personnel regarding strategy and tactics employed in Air Force contract negotiations. The proposition concerning agreement among upper and lower level managers with ragard to strategy was supported statistically, but not practically. A higher level of agreement was indicated, however, among upper level managers than lower level managers. Additional research is recommended into the impact which managers of other functional areas interfacing with procurement managers have on the strategic issues bearing on contract negotiations. (Modified author abstract)

AD-786 103/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
SCIENCE SYSTEM MANAGEMENT.
G. Dobrov. 19 Mar 74, 8p Rept no. FSTC-HT-23-114-74
Trans. of Nauka i Tekhnika (USSR) n8 p33-36 1972, by Markowitz.

Descriptors: *Research management, Decision making, Planning, Reviews, Translations, USSR.

Modern methods of management are essential for raising the effectiveness of scientific activity. Such management should be an organic part of a total system with clear lines of authority and a reliable flow of data between levels. Rational decision making depends on analysis, diagnosis and prognosis and aims at coordination of goal selection, work program determination and resource allocation. Models of science as a managed system may focus on informational, organizational and economic variables. Cybernetics and quantitative measures of performance are important tools for science management.

AD-786 217/0GA PC$4.25/MF$2.25
Texas Christian Univ Fort Worth Inst of Behavioral Research
ORGANIZATIONAL STRUCTURE: A REVIEW OF STRUCTURAL DIMENSIONS AND THEIR CONCEPTUAL RELATIONSHIPS WITH INDIVIDUAL ATTITUDES AND BEHAVIOR.
Technical rept.,
Lawrence R. James, and Allan P. Jones. 1 Aug 74, 62p Rept no. IBR-74-19
Contract N00014-72-A-0179-0001

Descriptors: *Organization theory, *Behavioral science, *Reviews, Group dynamics, Operations research, Attitudes(Psychology), Structural properties, Models, Behavior.

The paper reviews aspects of organizational structure and the conceptual relationships between organizational structure and individual attitudes and behavior. The review is separated into the following five parts: (1) the rationale underlying the

development of organizational structure, (2) a synthesis of dimensions of organizational structure with emphasis placed on the identification of major explanatory constructs of structure, (3) a review of the interrelationships of the proposed dimensions of organization structure, (4) a discussion of the conceptual relationships between organizational structure and individual attitudes and behavior, and (5) a summary and conclusions section. A potential model is proposed. (Modified author abstract)

AD-786 218/8GA PC$3.75/MF$2.25
Texas Christian Univ Fort Worth Inst of Behavioral Research
A NOTE ON PROBLEMS RELATED TO RATIONALE, MODELS, AND METHODOLOGY IN ORGANIZATIONAL ANALYSIS.
Technical rept.,
Lawrence R. James, and Allan P. Jones. 1 Sep 74, 34p Rept no. IBR-74-20
Contract N00014-72-A-0179-0001

Descriptors: *Organization theory, *Operations research, Organizations, Methodology, Mathematical models, Problem solving, Management planning and control, Measure theory.
Identifiers: Organizational analysis.

Three problem areas frequently encountered in organizational research are reviewed. These areas are: (a) investigative models and measurement rationale, (b) experimental design and statistical methodology, and (c) level of analysis versus level of explanation. The review identified several needs for future research. A major need is the development of complex, integrative models incorporating both individual and situational characteristics and allowing for adaptive-dynamic processes. The investigation of such models requires a move from static, cross-sectional paradigms to dynamic longitudinal methods. Some discussions are presented in this regard. (Modified author abstract)

COM-74-11485/1GA PC$7.00/MF$2.25
Patent Office, Washington, D.C.
TECHNOLOGY ASSESSMENT AND FORECAST. THIRD REPORT, JUNE 1974.
Final rept.
Jun 74, 181p* PAT-033.3-7406
See also report dated Dec 73, COM-74-10150.

Descriptors: *Patents, *Energy, Technology, Statistics, Forecasting, Fuels, Coal, Shale, Oils, Mines(Excavations), Conversion, Foreign, Engineering, Metallurgy, Optics, Nuclear research.
Identifiers: *Technology assessment.

The report reviews patented advances and processes involving energy technology. It gives broad and detailed view of international technological activity as well as activity of selected technological areas, including optical measuring and testing, nuclear testing, metal founding, fermentation, hydraulic and earth engineering, fertilizer, and industrial electric furnaces. It profiles the six leading states involved in technological activity, and a view of six general technological fields. Also included is a class listing of the U.S. Patent Classification System and information regarding where previous reports may be obtained.

N74-29530/4GA PC$13.50/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
COMPUTERIZED PROCESSING TREND MODEL FOR THE STANDARDIZED SIMULATION, ANALYSIS, AND CONTROL OF REAL SYSTEMS TRENDMODELL ZUR STANDARDISIERTEN NACHBILDUNG, ANALYSE UND FUEHRUNG REALER SYSTEME UNTER VERWENDUNG VON PROZESSRECHNERN.
Ph.D. Thesis.
M. Shahata. 1973, 206p
Language in German.

Descriptors: *Computerized simulation, *On-line programming, *Production engineering, Industrial management, Performance prediction, Production management.

For abstract, see STAR 1219

N74-29531/2GA PC$31.00/MF$2.25
Arbeitsgemeinschaft fuer Datenverarb- eitung, Vienna (Austria).
THE 4TH INTERNATIONAL CONGRESS ON DATA PROCESSING IN EUROPE 4. INTERNATIONALER KONGRESS "DATENVERARBEITUNG IM EUROPAISCHEN RAUM".
26 Oct 73, 558p
Conf-Conf. Held at Innsbruck, 22-26 Oct. 1973.
In English and German.

Descriptors: *Computer techniques, *Conferences, *Data processing, *Industrial management, Economic factors, Europe, Industrial plants, Information systems, Production engineering, Social factors.

For abstract, see STAR 1219

N74-29611/2GA PC$4.00/MF$2.25
Louisiana State Univ., Baton Rouge. Div. of Engineering Research.
MISSISSIPPI TEST FACILITY RESEARCH PROJECTS.
Final Report, Sep. 1971 - Aug. 1974.
C. A. Whitehurst. Aug 74, 19p NASA-CR-139370
Contract NGL-19-001-097

Descriptors: *Nasa programs, *University program, Research projects, Sea water, Transportation, Universities.

For abstract, see STAR 1219

N74-30379/3GA PC$7.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A MANAGEMENT INFORMATION SYSTEM MODEL FOR PROGRAM MANAGEMENT.
Ph.D. Thesis - Oklahoma State Univ.
D. L. Shipman. 28 Jul 72, 85p NASA-TM-X-70230

Descriptors: *Management information systems, *Models, *Project management, Computerized simulation, Programming languages, Systems analysis, Univac 1108 computer.

For abstract, see STAR 1219

N74-30392/6GA PC$12.00/MF$2.25
Boston Coll., Chestnut Hill, Mass. Management Inst.
DETERMINANTS OF PROJECT SUCCESS.
D. C. Murphy, B. N. Baker, and D. Fisher. 1974, 178p NASA-CR-139407
Contract NGR-22-003-028

Descriptors: *Management analysis, *Project management, Factor analysis, Independent variables, Methodology, Project planning.

For abstract, see STAR 1219

N74-31388/3GA PC$5.50
National Aeronautics and Space Administration, Washington, D.C.
MANAGEMENT: A CONTINUING LITERATURE SURVEY WITH INDEXES, MARCH 1974.
Mar 74, 157p NASA-SP-7500(08)

Descriptors: *Bibliographies, *Management methods, Management information systems, Management planning.

For abstract, see STAR 1220

N74-31392/5GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
NONLINEAR MODELS FOR ESTIMATING GSFC TRAVEL REQUIREMENTS.
C. Buffalano, and F. J. Hagan. Aug 74, 12p NASA-TN-D-7642, G-7415

Descriptors: *Mathematical models, *Nonlinear systems, *Regression analysis, *Travel, Data bases, Data processing, Resource allocation.

For abstract, see STAR 1220

UCID-16560 PC$7.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
PROFESSIONAL PERSONNEL POLICIES AND PRACTICES OF R AND D ORGANIZATIONS.
C. M. Van Atta, W. D. Decker, and T. Wilson. 6 Dec 71, 81p

Descriptors: (*Lawrence livermore laboratory, *Management), Economics, Education, Performance, Personnel, Recommendations, Research programs.

For abstract, see NSA 30 08, number 23286.

5B. Documentation and Information Technology

AD-785 600/8GA PC$11.50/MF$2.25
Office Chief of Research and Development (Army) Washington D C
PROCEEDINGS OF THE 1974 ARMY SCIENCE CONFERENCE HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N.Y., 18-21 JUNE 1974. VOLUME I. PRINCIPAL AUTHORS A THROUGH H.
26 Aug 74, 475p
See also Volume 2, AD-785 633.

Descriptors: *Scientific research, *Meetings, *Army, Military equipment, Materials, Electronics, Lasers, Ballistics, Solid state physics, Explosives, Electronics, Detectors, Military medicine, Aircraft equipment, Materials.

This is Volume I of the 1974 Army Science Conference Proceedings. This volume contains the unclassified papers by principal authors A thru H which were presented at the conference, 18-21 June 1974, U.S. Military Academy, West Point, New York.

AD-785 633/9GA PC$13.00/MF$2.25
Office Chief of Research and Development (Army) Washington D C
PROCEEDINGS OF THE 1974 ARMY SCIENCE CONFERENCE HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N.Y., 18-21 JUNE 1974. VOLUME II. PRINCIPAL AUTHORS I THROUGH R.
26 Aug 74, 559p
See also Volume 1, AD-785 600 and Volume 3, AD-785 672.

Descriptors: *Scientific research, *Meetings, *Army, Materials, Electronics, Military equipment, Microwave equipment, Propellants, Fuels, Hazards, Detectors, Military medicine, Lasers, Solid state physics.

This is Volume II of the 1974 Army Science Conference Proceedings. This volume contains the unclassified papers by principal authors I thru R which were presented at the conference, 18-21 June 1974, U.S. Military Academy, West Point, New York. Military Academy, West Point, New York.

AD-785 672/7GA PC$11.25/MF$2.25
Office Chief of Research and Development (Army) Washington D C

PROCEEDINGS OF THE 1974 ARMY SCIENCE CONFERENCE HELD AT UNITED STATES MILITARY ACADEMY, WEST POINT, N.Y., 18-21 JUNE 1974. VOLUME III. PRINCIPAL AUTHORS S THROUGH Z.
26 Aug 74, 440p
See also Volume 2, AD-785 633.

Descriptors: *Scientific research, *Meetings, *Army, Electronics, Soil mechanics, Military equipment, Lasers, Materials, Metals, Hazards, Explosives, Military medicine, Detectors, Solid state physics.

This is Volume III of the 1974 Army Science Conference Proceedings. This volume contains the unclassified papers by principal authors S thru Z which were presented at the conference, 18-21 June 1974, U.S. Military Academy, West Point, New York.

AD-785 726/1GA PC$3.75/MF$2.25
Office of Naval Research London (England)
EUROPEAN SCIENTIFIC NOTES. VOLUME 28, NUMBER 8,
Bruce J. McDonald, and Victoria S. Hewitson. 30 Aug 74, 48p Rept no. ESN-28-8
See also AD-783 028.

Descriptors: *Scientific research, *Europe, Periodicals, Reviews, Medicine, Psychology, Mathematics, Materials, Education, Engineering, Geodesy, Oceanography, Physics.

The monthly publication presents brief articles concerning recent developments in European scientific research. It is hoped that these articles (which do not constitute part of the scientific literature) may prove of value to American scientists by disclosing interesting information well in advance of the usual scientific publications. (Modified author abstract)

AD-785 973/9GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va.
REQUEST PRESENTATION FOR ECHELONED RETRIEVAL IN THE KVANTOR-8 INFORMATION RETRIEVAL SYSTEM,
Yu. P. Shevelev, Yu. M. Kostyrin, and B. S. Ryabyshin. 1 Apr 74, 18p Rept no. FSTC-HT-23-1877-73
Trans. of Nauchno-Tekhnicheskaya Informatsiya. Seriya II: Informatsionnye Protessy i Sistemy (USSR) n12 p30-33 1972.

Descriptors: *Information systems, Information retrieval, Search theory, Boolean algebra, Translations, USSR.

Data input-output functions of a special-purpose information retrieval system, the Kvantor-8 computer, are described. The input capacity is 12 different words, to which 12 logic variables are placed in correspondence. From these 12 variables, up to 12 different Boolean functions can be set up and a search conducted simultaneously over all functions.

AD-786 125/5GA PC$3.25/MF$2.25
Defence Research Information Centre Orpington (England)
DRIC LIBRARY BULLETIN. NUMBER 9, 1974.
1974, 19p
See also AD-784 108.

Descriptors: *Scientific research, *Abstracts, Information retrieval, Management, Defense systems, Computers, Great Britain.
Identifiers: Announcement bulletins.

The bulletin announces selected references to current periodical literature covering the fields of information science and technology, management, reprographic systems and some computer topics considered of interest to Ministry of Defence activities; also references to articles of importance issued by Defence Organisations.

COM-74-50847/4GA PC-GPO/MF$2.25-NTIS
Patent Office, Washington, D.C.
GENERAL INFORMATION CONCERNING PATENTS.
Mar 72, 47p PAT-005.1-7203
See also report dated Feb 70, COM-71-50028.
Paper copy available from GPO $0.45.

Descriptors: *Patents, Documents, Inventions, Drawings, Plants(Botany), Design, Instructions, Costs.
Identifiers: *Patent laws, Patent Office.

The report is a brief introduction to patent matters including: the workings of the United States Patent Office, what applicants for patents are required to do, and definitions of patents, including plant patents and design patents, copyrights and trademarks. A description of the publications of the Patent Office is also given.

COM-74-50930/8GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C.
PUBLICATIONS OF THE NATIONAL BUREAU OF STANDARDS. 1973 CATALOG. A COMPILATION OF ABSTRACTS AND KEY WORD AND AUTHOR INDEXES.
Special pub.,
Betty L. Oberholtzer. Jul 74, 349p NBS-SP-305-Suppl-5
See also Report no. NBS-SP-305-Suppl-4, COM-73-50931. Library of Congress Catalog Card no. 48-47112.
Paper copy available from GPO $4.15.

Descriptors: *Research, Bibliographies, Documents, Abstracts, Periodicals, Indexes(Documentation), Subject indexing, Authors, National government.
Identifiers: National Bureau of Standards, Author indexes.

The supplement to Special Publication 305 Supplements 1, 2, 3, and 4 of the National Bureau of Standards lists the publications of the Bureau issued between January 1, 1973 and December 31, 1973. It includes an abstract of each publication (plus some earlier papers omitted from Special Publication 305 Supplement 3), key-word and author indexes; and general information and instructions about NBS publications.

LIS-P-284 PC$12.75/MF$2.25
Institut Jozef Stefan, Ljubljana (Yugoslavia).
ANNUAL REPORT FOR 1973.
A. Smalc. Mar 74, 195p
In Slovene. U.S. Sales Only.

Descriptors: (*Chemistry, *Research programs), (*Biochemistry, Research programs), (*Reactors, Research programs), (*Electronic equipment, Research programs), Physical properties.

For abstract, see NSA 30 08, number 23282.

IS-3387 PC$4.00/MF$2.25
Ames Lab., Iowa.
DESCRIPTION OF A BATCH OPERATED RETROSPECTIVE INFORMATION RETRIEVAL SYSTEM.
J. R. Jordan, R. P. Sun, and C. G. Maple. Jul 74, 21p
Contract W-7405-eng-82

Descriptors: Bibliographies, Data processing, Information retrieval, Interfaces, Maintenance, Manuals, Operation, Programming.

For abstract, see NSA 30 08, number 23265.

IS-3388 PC$4.00/MF$2.25
Ames Lab., Iowa.
OPERATION AND MAINTENANCE OF THE RARE-EARTH INFORMATION CENTER'S INFORMATION RETRIEVAL SYSTEM (RICIRS).
J. R. Jordan, R. P. Sun, and C. G. Maple. Jul 74, 17p
Contract W-7405-eng-82

Descriptors: (*Rare earths, *Information systems), Bibliographies, Information retrieval, Maintenance, Operation.

For abstract, see NSA 30 08, number 23266.

IS-3390 PC$5.45/MF$2.25
Ames Lab., Iowa.
SDI OPERATING AND MAINTENANCE MANUAL.
R. P. Sun, J. R. Jordan, and C. G. Maple. Jul 74, 87p
Contract W-7405-eng-82

Descriptors: Flowsheets, Information, Information retrieval, Information systems, Maintenance, Management, Manuals, Specifications.

For abstract, see NSA 30 08, number 23267.

N74-30705/9GA PC$16.80/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THIRD EARTH RESOURCES TECHNOLOGY SATELLITE-1 SYMPOSIUM. VOLUME 1: TECHNICAL PRESENTATIONS, SECTION A.
S. C. Freden, E. P. Mercanti, and M. A. Becker. 1974, 992p NASA-SP-351-VOL-1-SECT-A
Conf-Symp. Held at Washington, D. C., 10-14 Dec. 1973.

Descriptors: *Conferences, *Earth resources program, *Management planning, *Resources management, Agriculture, Forests, Land use, Landforms, Mapping, Mineral deposits, Range resources, Structural properties (Geology).

For abstract, see STAR 1220

N74-30774/5GA PC$16.80/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THIRD EARTH RESOURCES TECHNOLOGY SATELLITE-1 SYMPOSIUM. VOLUME 1: TECHNICAL PRESENTATIONS, SECTION B.
S. C. Freden, E. P. Mercanti, and M. A. Becker. 1974, 936p NASA-SP-351-VOL-1-SECT-B
Conf-Symp. Held at Washington, D. C., 10-14 Dec. 1973.

Descriptors: *Conferences, *Earth resources program, *Management planning, *Resources management, Agriculture, Forests, Land use, Landforms, Mapping, Mineral deposits, Range resources, Structural properties (Geology).

For abstract, see STAR 1220

N74-31391/7GA PC$7.25/MF$2.25
Southeastern State Coll., Durant, Okla. Technology Use Studies Center.
TECHNOLOGY UTILIZATION IN A NON-URBAN REGION: FURTHER IMPACT AND TECHNIQUE OF THE TECHNOLOGY USE STUDIES CENTER.
Final Report.
C. H. Gold, A. M. Moore, B. Dodd, and V. Dittmar. Jun 74, 82p NASA-CR-139565
Contract NASW-2512

Descriptors: *Information dissemination, *Technology utilization, Data retrieval, Information management, Search profiles, Services, System effectiveness.

For abstract, see STAR 1220

PB-235 299/5GA PC$4.25/MF$2.25
Naval Research Lab., Washington, D.C.
REPORT OF NRL PROGRESS.
Mar 74, 69p
Also available on subscription $22.50/year domestic, $28.25/year foreign.

Descriptors: *Naval research, *Periodicals, Voice communication, Acoustic, Metallurgy, Nuclear physics, Radar, Space sciences, Patents, Optics, Molecular structure, Geophysics, Steels.

Contents: The communications sciences division-three challenges for 1975-80; Linear predictive narrowband voice digitizer; A method of detecting the presence of a shear pin in the Ex161 primer; Progress notes in the following areas; Acoustics; communications sciences; metallurgy; nuclear sciences; radar; space science; patents.

PB-235 868/7GA PC$4.25/MF$2.25
British Library Lending Div., Boston Spa (England).
LIST OF BOOKS RECEIVED FROM THE USSR AND TRANSLATED BOOKS.
Jul 74, 61p LBRU-191
See also PB-235 118.

Descriptors: *Books, *USSR, *Indexes(Documentation), *Bibliographies, Sociology, Mathematics, Physics, Engineering, Chemistry, Medicine, Electronics, Agriculture, Industries, Construction, Textiles, Great Britain.

The list of books from the U.S.S.R. is arranged in broad subject groups, approximately in U.D.C. order, sub-divided by authors in the order of the Cyrillic alphabet. Translated Russian books are included as a separate section following the main part of the list, also in subject groups; sub-divided by authors in the order of the Roman alphabet.

PB-235 869/5GA PC$5.25/MF$2.25
British Library Lending Div., Boston Spa (England).
BLL ANNOUNCEMENT BULLETIN. A GUIDE TO BRITISH REPORTS, TRANSLATIONS AND THESES.
Jul 74, 116p BAB-74-7
See also PB-235 119.

Descriptors: *Research, *Technical reports, *Great Britian, *Bibliographies, Translations, Theses, Universities, Industries, Government.
Identifiers: Announcement bulletins.

The bulletin lists British report literature and translations produced by British government organizations, industry, universities and learned institutions, as well as some doctoral theses accepted at British universities during and after 1970.

PB-235 870/3GA PC$4.25/MF$2.25
British Library Lending Div., Boston Spa (England).
INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE BLL.
Jul 74, 72p ICP-82
See also PB-235 120.

Descriptors: *Meetings, *Indexes(Documentation), Great Britain, Agriculture, Food, Biology, Medicine, Chemistry, Engineering, Physics, Transportation, Construction, Pollution, Management, Sociology.

The index reports recent conference proceedings in the fields of the natural sciences, the technologies, the social sciences and the humanities. All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. The use of the index is by subject keywords taken from the title of the Conference proceedings.

PB-235 928/9GA PC$5.25/MF$2.25
Massachusetts ST. OF Tech., Cambridge. Electronic Systems Lab.
NASIC AT MIT: PHASE 1 REPORT, 16 JULY 1973-28 FEBRUARY 1974.
Alan R. Benenfeld, Mary E. Pensyl, Richard S. Marcus, and J. Francis Reintjes. Mar 74, 102p
ESL-R-543
Grant NSF-GN-37296
Sponsored in part by New England Board of Higher Education, Wellesley, Mass.

Descriptors: *Information systems, *Operations analysis, Libraries, Information retrieval, Computers, Man machine systems, Search structuring, Cost effectiveness, Feasibility.

An experimental, pilot operation of computer-based reference search services to users on a fee-for-service basis was initiated at M.I.T. as the first node in the development of the Northeast Academic Science Information Center (NASIC) under a New England Board of Higher Education (NEBHE) program. The development encompassed selection of services, training for services, developing initial organizational and operational policies and capabilities, publicity, and operations monitoring procedures. A fundamental philosophy is to integrate these services within the library environment where they compelent traditional services.

PB-235 982/6GA PC$4.25/MF$2.25
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
AUSTRALIAN SCIENCE INDEX, VOLUME 18, NUMBER 5, MAY 1974.
May 74, 64p
Index of articles published in Australian scientific and technical serials. See also Volume 18, no. 3, PB-234 717.

Descriptors: *Research, *Indexes(Documentation), *Australia, Physics, Mathematics, Astronomy, Geology, Mineralogy, Hydrology, Chemistry, Engineering, Biology, Agriculture, Periodicals, Technical reports.

The classified section of the Index is divided into the following major subject areas: Mathematics; physics; astronomy and astrophysics; earth sciences; chemistry; engineering and technology; biological sciences; agriculture, forestry and fisheries.

PB-235 993/3GA PC$4.25/MF$2.25
Naval Research Lab., Washington, D.C.
REPORT OF NRL PROGRESS, APRIL 1974.
Monthly rept.,
William M. Leak, and Daniel R. Nelson. Apr 74, 71p
Also available on subscription $22.50/year domestic, $28.25/year foreign.

Descriptors: *Naval research, *Periodicals, Acoustics, Fog, Arctic regions, EDTA, Distribution functions, Monte Carlo method, Metallurgy, Nuclear physics, Submarine rescue, Laser beams, Radar cross sections, Solid state physics, Spacecraft communication.

Contents: Laboratory for chemical physics; Wave-damping and film-pressure studies of polydimethylsiloxane monolayers on organic liquid substrates; Acoustics; Atmospheric physics; Chemistry; Mathematics; Metallurgy; Nuclear sciences; Ocean technology; Optical physics; Radio and radar; Solid state physics; Space systems.

PB-236 046/9GA PC$4.25/MF$2.25
North Carolina Water Resources Research Inst., Raleigh.
METHODS FOR TRANSFERRING WATER RESOURCES RESEARCH FINDINGS TO PRACTICING ENGINEERS.
Completion rept.,
James C. Lamb, III. Jun 74, 60p UNC-WRRI-74-96 W74-12363, OWRR-A-066-NC(1)
Contract DI-14-31-0001-3833

Descriptors: *Technology transfer, *Water resources, Professional personnel, Research projects, Information retrieval, Education, Water quality management, North Carolina.

Origins of communication problems between researchers and those who should use their findings in solving real-world problems are reviewed. Existing systems for continuing education of water resources professionals are seriously deficient in resolving these problems. A survey identified areas of water resources knowledge of greatest interest to practicing professionals in North Carolina. Available techniques for information transfer were surveyed and evaluated for potential application under conditions prevalent in North Carolina. Pilot modules based on taped lectures, slides and written materials were prepared and tested with representative groups of practicing professionals and found to be an effective method of transferring research findings to water resources engineers and other practitioners.

5C. Economics

AD-785 950/7GA PC$6.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
A STUDY IN THE APPLICATION OF THE COST CENTER PERFORMANCE SUMMARY TO THE MANAGERIAL DECISION-MAKING PROCESS.
Master's thesis,
Donald F. Ferris, and Frederick Y. Smith. Aug 74, 151p Rept no. SLSR-9-74B

Descriptors: *Finance, *Management, *Decision making, Control, Resources, Costs, Questionnaires, Theses.
Identifiers: *Cost center performance summary, *Financial management.

The Cost Center Performance Measurement System is a financial management system that was implemented to help managers make better use of Air Force resources by assisting them in making decisions. The heart of this financial management system is the Cost Center Performance Summary (CCPS). This study was conducted to determine the extent to which financial managers within the Strategic Air Command and the United States Air Force in Europe were utilizing the CCPS to influence their managerial decisions. (Modified author abstract)

AD-786 189/1GA PC$4.25/MF$2.25
Pennsylvania State Univ University Park Coll of Business Administration
SEVEN INDEPENDENCE CONCEPTS AND CONTINUOUS MULTIATTRIBUTE UTILITY FUNCTIONS.
Technical rept.,
Peter C. Fishburn, and Ralph L. Keeney. Sep 74, 54p Rept no. TR-10
Contract N00014-67-A-0385-0021
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge.

Descriptors: *Economic models, *Decision making, Mathematical programming, Risk, Convex sets, Theorems.
Identifiers: *Utility functions, Preferences, Indifferences curves, Axioms.

This paper examines seven independence concepts based on a preference relation on the set of simple probability measures defined on a set of multiattribute consequences. Three of the independence relations involve gambles and the other four are based on riskless preferences over the n-tuples in the consequence set. The main theorems state conditions under which one or more of the risky independence relations can be derived from a riskless independence relation in conjunction with other conditions. The other conditions include the assumptions that the consequence set is a convex subset of a finite-dimensional Euclidean space and that the individual's von Neumann-Mor-

genstern utility function on the consequence set is continuous. (Author)

AD-786 191/7GA PC$3.75/MF$2.25
Pennsylvania State Univ University Park Coll of Business Administration
SEPARATION THEOREMS AND EXPECTED UTILITIES.
Technical rept.,
Peter C. Fishburn. Sep 74, 32p Rept no. TR-12
Contract N00014-67-A-0385-0021

Descriptors: *Economic models, *Decision making, *Risk, Linear programming, Game theory, Convex sets, Vector spaces, Boolean algebra, Theorems.
Identifiers: *Utility theory, Preferences, Indifference, Utility functions, Axioms.

This paper presents a number of separation theorems for linear spaces, then explores the relationships between these theorems and expected utility theory. Three topics in expected utility are discussed: axioms for expected utility; unanimous expectations; and revealed preference and indifference in situations of decision making under risk. (Author)

COM-74-10483/GA
see prices of individual reports
International Customs Tariffs Bureau, Brussels (Belgium).
INTERNATIONAL CUSTOMS JOURNAL. YEAR 1973-1974.
Bulletins.
1973,74approx. 50 issues annually

The reports present authoritative information for exporters, importers, investors, manufacturers, and those concerned with international trade. They contain the schedules of duties and exemptions applicable to goods imported into or exported from the country. Order by individual numbers listed below:

Bull-27. Mexico. 13th ed, Mar 74, 455p, PC$9.25/MF$2.25, supersedes COM-71-00030, COM-71-00030-01 COM-74-10483-27/GA
Bull-54. Cyprus. 13th ed, Mar 74, 243p, PC$6.00/MF$2.25, supersedes COM-71-00155, COM-71-00155-01, COM-71-00155-02 COM-74-10483-54/GA

COM-74-11538/7GA PC$5.25/MF$2.25
Bureau of Economic Analysis, Washington, D.C.
RELIABILITY OF THE QUARTERLY NATIONAL INCOME AND PRODUCT ACCOUNTS OF THE UNITED STATES, 1947-71.
Staff paper, 1947-71,
Allan H. Young. Jul 74, 104p BEA-SP-74-023

Descriptors: *Gross national product, *National income, *Statistical reports, Quarterly indexes, Estimates, Reliability, Accounting, Error analysis, Sources, Checkout, Methodology, Annual indexes, United States.

The report explores possible sources of error in estimating the accounts of U.S. national income and product, and considers four ways of assessing the reliability of these accounts. The degree of accuracy is judged to be generally sufficient for the policy decisions for which the national income and product accounts are used. Included is a summary of the data sources used in preparing the quarterly and annual estimates of components.

COM-74-11539/5GA PC$5.25/MF$2.25
RAND Corp., Santa Monica, Calif.
SUGGESTIONS FOR ASSESSING ECONOMIC AND DEMOGRAPHIC EFFECTS OF INCOME MAINTENANCE PROGRAMS.
Research rept.,
Julie DaVanzo, and David H. Greenberg. Jun 73, 112p* R-1211-EDA EDA/OER-74-336
Grant EDA-OER-388-G-71-11

Descriptors: *Income, *Stabilization policies, *Program review, Legislation, Supplements, Survey methods and procedures, Recommendations, Economic impact, Demography, Regional economy, Social planning.
Identifiers: *Income maintenance.

The report summarizes the main findings of research performed under grant entitled: 'Income Supplements and Regional Economic Development.' It discusses the principal issues and problems in estimating the effects of income maintenance legislation, evaluates the reasonableness of further empirical study of this issue, and provides specific recommendations for future research.

COM-74-11552/8GA PC$7.25/MF$2.25
Texas A and M Univ., College Station. Industrial Economics Research Div.
PRIMARY ECONOMIC IMPACT OF THE GULF INTRACOASTAL WATERWAY IN TEXAS,
John Miloy, and Christian Phillips. Mar 74, 207p
TAMU-SG-74-211 NOAA-74090301
Grant NOAA-04-3-158-18

Descriptors: *Economic impact, *Waterways(Transportation), *Coastal zones, *Texas, Gulf Intracoastal Waterway, Land use, Commodity shipments, Industries, Technological advancement, Economic growth.
Identifiers: Sea Grant program.

Preparation of the report was undertaken to identify and quantify marine-related activities of the Waterway contributing directly to the economy of Texas. A significant effort was made by the authors to include information relative to the development and growth of the Waterway. In addition to analyses of current and future economic impact, particular emphasis was placed on history, land use, commodity flows, industrial users, and technological innovations relating to the Waterway.

COM-74-50061/GA PC$0.25/copy
Bureau of International Commerce, Washington, D.C.
FOREIGN ECONOMIC TRENDS AND THEIR IMPLICATIONS FOR THE UNITED STATES.
1974,147 issues
Paper copy available from GPO $37.50/year as C42.30.

The series of reports presents current business and economic developments in every country that offers a present or potential market for United States goods. The reports include a summary of the prospective impact on the United States economy, changing trade patterns prospective business trends, balance of payments, government policies, and investments. For individual country reports, order by COM-number listed below:

ET-74-090. New Zealand. Semiannual rept. Aug 74, 12p, supersedes ET-74-012 COM-74-50061-090/GA
ET-74-091. Burundi. Annual rept. Aug 74, 11p, supersedes ET-73-044 COM-74-50061-091/GA
ET-74-092. Peru. Semiannual rept. Aug 74, 11p, supersedes ET-73-132 COM-74-50061-092/GA
ET-74-093. Romania. Annual rept. Sep 74, 7p COM-74-50061-093/GA
ET-74-094. Tanzania. Annual rept. Sep 74, 11p, supersedes ET-73-095. COM-74-50061-094/GA
ET-74-095. Sierra Leone. Annual rept. Sep 74, 8p, supersedes ET-73-097 COM-74-50061-095/GA
ET-74-096. United Kingdom. Semiannual rept. Sep 74, 11p, supersedes ET-74-048 COM-74-50061-096/GA

COM-74-50113/GA
PC-GPO/MF$2.25-NTIS/copy
Domestic and International Business Administration, Washington, D.C.
OVERSEAS BUSINESS REPORTS.
1974,approx. 99 issues
Paper copy available from GPO $28.50/year as C1.50:74, $0.30/copy.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

OBR-74-40. World Trade Outlook for the Far East. Sep 74, 12p COM-74-50113-40/GA
OBR-74-42. World Trade Outlook for Africa. Sep 74, 9p COM-74-50113-42/GA
OBR-74-43. World Trade Outlook for Latin America. Sep 74, 9p COM-74-50113-43/GA

COM-74-50843/3GA PC-GPO/MF$2.25-NTIS
Bureau of Economic Analysis, Washington, D.C.
INPUT-OUTPUT STRUCTURE OF THE U.S. ECONOMY: 1967. VOLUME 1. TRANSACTIONS DATA FOR DETAILED INDUSTRIES.
Sep 74, 208p BEA-SUP-74-03
Supplement to the Survey of Current Business. Sponsored in part by Department of Transportation, Washington, D.C. and Defense Civil Preparedness Agency, Washington, D.C. See also Volume 2, COM-74-50844 and Volume 3, COM-74-50845.
Paper copy available from GPO $3.25.

Descriptors: *Economic analysis, *Interindustry transactions, *Industrial surveys, United States, Value, Marketing, Statistical distributions, Raw materials consumption, Semifinished goods, Services, Value added, Output.
Identifiers: Input output surveys.

The report shows for 1967 the dollar value of transactions among the various industries, the sales of each industry to final markets and the value added originating in each industry. Each row of a table displays the distribution of the output of goods and services of the industry named at the beginning of the row to each of the industries and final users named across the top of the table. The columns show the value of each industry's current consumption (input) of raw materials, semifinished products and services, and value added in production.

COM-74-50844/1GA PC-GPO/MF$2.25-NTIS
Bureau of Economic Analysis, Washington, D.C.
INPUT-OUTPUT STRUCTURE OF THE U.S. ECONOMY: 1967. VOLUME 2. DIRECT REQUIREMENTS FOR DETAILED INDUSTRIES.
Sep 74, 196p BEA-SUP-74-04
Supplement to the Survey of Current Business. Sponsored in part by Department of Transportation, Washington, D.C. and Defense Civil Preparedness Agency, Washington, D.C. See also Volume 1, COM-74-50843 and Volume 3, COM-74-50845.
Paper copy available from GPO $3.15.

Descriptors: *Economic analysis, Industrial surveys, *Demand(Economics), Input, Output, Correlations, Industries, Commodity categories.
Identifiers: Input output surveys.

The report relates for 1967 each of the inputs of an industry to its total output. Each column in the table shows the inputs that the industry named at the head of the column required from each of the industries named at the beginning of the rows to produce a dollar of its output in 1967.

COM-74-50845/8GA PC-GPO/MF$2.25-NTIS
Bureau of Economic Analysis, Washington, D.C.
INPUT-OUTPUT STRUCTURE OF THE U.S. ECONOMY: 1967. VOLUME 3. TOTAL REQUIREMENTS FOR DETAILED INDUSTRIES.
Sep 74, 198p BEA-SUP-74-05

Supplement to Survey of Current Business. Sponsored in part by Department of Transportation, Washington, D.C. and Defense Civil Preparedness Agency, Washington, D.C. See also Volume 1, COM-74-50843 and COM-74-50344.
Paper copy available from GPO $3.15.

Descriptors: *Economic analysis, *Industrial surveys, *Econometrics, United States, Industries, Output, Classifications, Statistical data.
Identifiers: Input output surveys.

The report shows for 1967 the direct and indirect effects of final demand on the output of each industry. Each column in the table shows the amount of output required both directly and indirectly from each of the industries named at the beginning of the rows for a dollar of deliveries to final demand by the industry named at the head of the column.

COM-74-50882/1GA PC$4.75/MF$2.25
Economic Development Administration, Washington, D.C. Office of Economic Research.
THE RESEARCH REVIEW, 1974.
1974, 78p EDA/OER-75-001

Descriptors: *Economic development, *Regional planning, Reviews, Air pollution, Industries, Rural areas, Central city, Economic changes, Industry expansion, Minority enterprises, Industrial parks, Colorado, Puerto Rico, Computer programming, Mapping, Research.
Identifiers: Composite mapping.

Within the frame of economic development and regional problems, reports deal with the following subjects: air pollution abatement, policy making, industrial location determinants, industry clusters, composite mapping systems, low income areas, minority groups, migration, Indian communities, and economically distressed areas.

COM-74-70088/1GA Not available NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF MANUFACTURES: 1972 (ADVANCE REPORT). INDUSTRY SERIES. GENERAL STATISTICS FOR INDUSTRY GROUPS AND INDUSTRIES.
1973, 25p MC72(A)-1
Paper copy available from Social and Economic Statistics Administration, Washington, D.C. 20233. $0.35/copy.

Descriptors: *Manufacturing industry statistics, *Manufacturers census, *Census, Tables(Data), Employment, Salaries, Manufacturers inventories, Manufacturing statistics, Value, Manufacturers shipments.

The report provides general statistics estimates for industry groups and industries on: Total number of employees and total payroll of all employees; number of production workers, man-hours, and wages; value added by manufacture; cost of material; new capital expenditures; and end-of-year inventories for 1972 and 1971, with some comparative data for 1967. The data are sample estimates based on the Annual Survey of Manufactures which was conducted as an integral part of the 1972 Census of Manufactures. Establishments are classified in manufacturing industries in accordance with industries described in the 1968 Standard Industrial Classification (SIC) Manuel.

COM-74-70089/9GA Not available NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF MANUFACTURERS: 1972 (ADVANCE REPORT). AREA SERIES. GENERAL STATISTICS FOR GEOGRAPHIC DIVISIONS AND STATES.
Dec 73, 8p MC72(A)-2
Paper copy available from Social and Economic Statistics Administration, Washington, D.C. 20233, $0.35/copy.

Descriptors: *Manufacturing industry statistics, *Census, Tables(Data), Manufacturers census, Employment, Salaries, Manufacturers inventories, Manufacturing statistics, Value, Manufacturers shipments.

The advance report provides general statistics estimates for the United States for 1958 to 1972 and for census divisions and states for 1972 and 1971 on: Total number and payroll of all employees; number, man-hours, and wages of production workers; value added by manufacture; cost of materials; value of shipments; new capital expenditures; and end-of-year inventories. Comparative data for 1967 are listed for number of employees and value added by manufacture. The data are sample estimates based on the Annual Survey of Manufacturers which was conducted as part of the 1972 Census of Manufactures.

PB-235 242/5GA PC$7.25/MF$2.25
Transportation Data Coordinating Committee, Washington, D.C.
STANDARD TRANSPORTATION COMMODITY DESCRIPTION AND CODE SYSTEM. SUPPLEMENT TO PHASE IV REPORT.
Rept. for May-Jul 74,
T. H. Desnoyers, G. M. Forrest, and E. A. Guilbert. Jul 74, 201p* TDCC-74-104A
Contract DOT-OS-10205
See also Phase 4 report, PB-233 985.

Descriptors: *Nomenclature, *Commodity classification system, *Cargo transportation, *Commodity transportation, Documentation, Standardization, Subject index terms, Coding, Terminology, Commodity categories, Tariffs, International trade.
Identifiers: *Commodity descriptors.

This is a supplement to the fourth and final report on Commodity Descriptions and Coding provided to the Department of Transportation by the Transportation Data Coordinating Committee. The supplement completes the Brussels Nomenclature/Standard International Trade Classification (BTN/SITC) harmonization for all the industries contained in the Standard Transportation Commodity Code manual.

PB-235 585/7GA PC$4.75/MF$2.25
Northwestern Univ., Evanston, Ill. Graduate School of Management.
MARKET STRUCTURE AND INNOVATION: A SURVEY.
Technical rept.,
Morton I. Kamien, and Nancy L. Schwartz. Jun 74, 98p* NSF/RDA-73-6-3
Grant NSF-DA-39390

Descriptors: *Market analysis, *Technological advances, Research, Development, Technological advancement, Resources, Profits, Inventions, Patents, Industries, Market growth.
Identifiers: Innovation(Technology).

Contents: The inventive process; Results of innovative activity; Monopoly power and large size are good; Evidence on firm size; Market structure and innovation; Supposed advantages of size or power; The case for collective action; New defenses of the market mechanism; The unresolved case and neo-Schumpeterian analysis.

PB-235 648/3GA PC$7.00/MF$2.25
Northwestern Univ., Evanston, Ill. Graduate School of Management.
MARKET STRUCTURE AND INNOVATION: A SURVEY SUPPLEMENT: PRECIS/ANNOTATED BIBLIOGRAPHY,
Morton I. Kamien, and Nancy L. Schwartz. Jun 74, 191p* NSF/RDA-73-6-1
Grant NSF-DA-39390
See also PB-235 649.

Descriptors: *Market analysis, *Technological advances, *Bibliographies, Research, Development, Technological advancement, Resources, Profits, Inventions, Patents, Industries, Market growth.
Identifiers: Innovation(Technology).

The volume is a set of extended abstracts stemming from a research project which examined the reciprocal relationship between market structure and technological innovation (including R&D) by reviewing, assessing, and synthesizing the existing literature.

PB-235 649/1GA PC$3.25/MF$2.25
Northwestern Univ., Evanston, Ill. Graduate School of Management.
MARKET STRUCTURE AND INNOVATION: A SURVEY.
Summary rept.,
Morton I. Kamien, and Nancy L. Schwartz. Jun 74, 11p* NSF/RDA-73-6-2
See also PB-235 648.

Descriptors: *Market analysis, *Technological advances, Research, Development, Technological advancement, Resources, Profits, Inventions, Patents, Industries, Market growth.
Identifiers: Innovation(Technology).

The summary is one of three volumes which examined market structure and innovation. The study examined the reciprocal relationship between market structure and technological innovation (including R&D) by reviewing, assessing, and synthesizing the existing literature. The output consists of a technical report of 94 pages reflecting the status of research in the field, a set of approximately one hundred precis of the significant works in the field and an executive summary. Major topics covered are: The inventive process; Results of innovative activity; Evidence on firm size, market structure and innovation; Supposed advantages of size or power, the case of collective action; New defenses of the market mechanism and the unresolved case; and Neo Schumpeterian analysis.

5D. History, Law, and Political Science

AD-785 893/9GA PC$5.25/MF$2.25
Rand Corp Santa Monica Calif
AN ESSAY ON VIETNAMIZATION,
Guy J. Pauker. Mar 71, 104p Rept no. R-604-ARPA
Contract DAHC15-67-C-0142, ARPA Order-189-1

Descriptors: *Foreign policy, *United States government, *Vietnam, Communism, Foreign aid, Agreements, Economics.
Identifiers: Vietnamization.

The author presents his studies on the conflicting requirements of negotiations and Vietnamization as regards American foreign policy.

COM-74-11495/9GA PC$4.25/MF$2.25
National Bureau of Standards, Washington, D.C. Law Enforcement Standards Lab.
PROJECT PLANS, FISCAL YEAR 1974: LAW ENFORCEMENT STANDARDS LABORATORY.
Final rept.,
Jacob J. Diamond. Jul 73, 73p NBSIR-74-529
Sponsored in part by National Inst. of Law Enforcement and Criminal Justice, Washington, D.C.

Descriptors: *Law enforcement, *Federal programs, *Project planning, Performance standards, User needs, Communications management, Security systems, Protective clothing, Criminal investigations, Detectors, Emergency preparedness, Lighting equipment, Sirens, Body armor, Warning systems.
Identifiers: Forensic science.

Plans are presented for nineteen law enforcement projects approved and funded for FY-74. They include plans for the preparation of performance standards, user guidelines, and reports on enforcement equipment in the communications, security, protective equipment, and clothing areas.

PB-236 096/4GA PC$4.75/MF$2.25
National Park Service, Denver, Colo. Historic Preservation Team.
NEZ PERCE NATIONAL HISTORICAL PARK, IDAHO. HISTORIC STRUCTURE REPORT, ARCHITECTURAL DATA, SPALDING AREA.
David G. Henderson. Jan 74, 98p FNP-PD-74-19

Descriptors: *National parks and preserves, *American Indians, *Historical data, Villages, Buildings, Structures, National parks, History.
Identifiers: *Historic structures, Nez Perce Indians, *Nez Perce National Historical Park, Restoration, Preservation.

The Spalding Area of Nez Perce National Historical Park served successively as a prehistoric Indian village, Nez Perce camp, church mission, Indian agency, and small Idaho town. The report describes in detail the few buildings remaining from Mission, Agency, and small town days and discusses the park's proposed treatments of the buildings. Available period and present-day photographs are included. The report illustrates how complex a historical architect's decisions are made by frequently remodeled buildings representing different time periods and interpretive themes.

PB-236 275/4GA PC$7.50/MF$2.25
Research Foundation of the Bar Association of the District of Columbia, Washington.
LAW, MENTAL DISORDERS AND THE JUVENILE TREATMENT PROCESS: TRANSCRIPT OF CONFERENCE ON THE RIGHT TO TREATMENT AND THE RIGHT TREATMENT. VOLUME 4.
Final rept.
30 Apr 71, 229p SRS-89-80056-34
Grant SRS-89-80056
Proceedings of Conference held at Georgetown Univ., Washington, D.C. on Friday, April 30, 1971.

Descriptors: *Juvenile delinquency, *Mental disorders, *Meetings, Courts, Law(Jurisprudence), Therapy.
Identifiers: Mentally retarded persons.

The 5-year (1967-1971) research project undertook a variety of studies to examine the processing by juvenile courts of allegedly delinquent juveniles who are also mentally disturbed. Volume 4 of the four-volume report contains the proceedings of a conference which focused on four presentations concerning successful treatment programs for such delinquents and the legal problems surrounding the commitment process.

5E. Human Factors Engineering

AD-785 906/9GA PC$4.25/MF$2.25
California Univ Berkeley Dept of Architecture
METHODS FOR THE DEVELOPMENT OF SHIPBOARD HABITABILITY DESIGN CRITERIA. A REPORT ON SUBJECTIVE RESPONSE TO LIGHTING AND COLOR IN INTERIOR SPACE: A STUDY OF SHIPS' MESSING AREAS, AND FINAL REPORT FOR PERIOD ENDING MAY 31, 1974,
Craig McArt, Hugo Blasdel, and Sami Hassid. Jul 74, 66p
Contract N00014-69-A-0200-1058
See also report dated May 74, AD-781 889.

Descriptors: *Environmental engineering, *Naval vessels, Habitability, Lighting equipment, Colors, Perception(Psychology), Human factors engineering, Illumination, Models, Questionnaires, Surveys, User needs, Naval research.
Identifiers: Design criteria, Messing areas, Furniture.

This study investigates the perceptual and affective aspects of lighting and color applications in the messing areas of Navy ships by means of a literature survey and four experiments. The literature survey summarizes current work on the influence of color and lighting on the occupants of an interior space, and on the occupants perception of size, distance, temperature and weight. In the experiments Navy personnel evaluated slide views of a messing area simulated by a demountable scale model which was constructed to allow for variation in color scheme and lighting arrangement. Further, the study examines methods for the identification of user requirements and their incorporation in the design process. (Modified author abstract)

N74-29460/4GA PC$6.00/MF$2.25
Virginia Univ., Charlottesville. Dept. of Engineering Science and Systems.
RIDE QUALITY EVALUATION 1: QUESTIONNAIRE STUDIES OF AIRLINE PASSENGER COMFORT.
L. G. Richards, and I. D. Jacobson. Jul 74, 58p
NASA-CR-139368, MEMO-403214
Contract NGR-47-005-181

Descriptors: *Airline operations, *Comfort, *Passenger aircraft, Aircraft safety, Human factors engineering, Seats, Temperature.

For abstract, see STAR 1219

N74-29610/4GA PC$4.00/MF$2.25
Virginia Univ., Charlottesville. Dept. of Engineering Science and Systems.
SIMULATORS' VALIDATION STUDY: PROBLEM SOLUTION LOGIC.
Short-Haul Air Transportation Program.
M. B. Schoultz. Mar 74, 19p NASA-CR-138305, MEMO-403213
Contract NGR-47-005-181

Descriptors: *Flight simulators, *Human factors engineering, *Performance tests, *Short haul aircraft, Air transportation, Environmental tests, Mathematical models, Numerical analysis.

For abstract, see STAR 1219

SCR-685 PC$5.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
METHOD FOR PERFORMING A HUMAN-FACTORS RELIABILITY ANALYSIS.
A. D. Swain. Aug 63, 52p

Descriptors: Automation, Errors, Machine parts, Man, Performance testing, Reliability, Work.

For abstract, see NSA 30 08, number 23387.

5G. Linguistics

AD-785 759/2GA Reprint
Massachusetts Inst of Tech Cambridge
THE DURATION OF (S) IN ENGLISH WORDS,
Dennis Klatt. 1 Nov 73, 10p
Contract F19628-69-C-0044
Sponsored in part by National Institutes of Health, Bethesda, Md. Revision of report dated 18 Oct 73.
Availability: Pub. in Jnl. of Speech and Hearing Research, v17 n1 p51-63 Mar 74.

Descriptors: *Phonetics, *Sound, Linguistics, Speech, Phonology, English language.

The duration of the phonetic segment (s) has been measured from recordings made by three talkers of English words embedded in the frame sentence 'Say — instead.' Results indicate that the duration of (s) depends on whether the following vowel nucleus is stressed or not, but the duration is independent of the degree of stress on the vowel. An (s) is longer in prestressed position and shorter before unstressed vowels and in word-final position. The (s) duration does not appear to depend on the position of a syllable in the word. An (s) is shorter in multisyllabic words and in consonant cluster sequences. The locations of syllable boundaries and morpheme boundaries do not influence the duration of an intervocalic (s). The relatively large durational variability of (s) before an unstressed vowel suggests that unstressed syllables are articulated with less precision than are stressed syllables and supports the notion that lexical stress is a feature the domain of which encompasses both consonants and vowels. (Author)

5H. Man-Machine Relations

N74-29459/6GA PC$8.25/MF$2.25
Essex Corp., Alexandria, Va.
MANIPULATOR SYSTEM MAN-MACHINE INTERFACE EVALUATION PROGRAM.
T. B. Malone, M. Kirkpatrick, and N. L. Shields. Jan 74, 102p NASA-CR-120218, H-4-3
Contract NAS8-28298

Descriptors: *Man machine systems, *Manipulators, Human factors engineering, Project planning, Teleoperators.

For abstract, see STAR 1219

N74-30274/6GA PC$4.75/MF$2.25
Essex Corp., Alexandria, Va.
TELEOPERATOR DOCKING SIMULATION.
M. Kirkpatrick, and R. G. Brye. Jan 74, 32p
NASA-CR-120220, H-4-4
Contract NAS8-28298

Descriptors: *Motion simulators, *Remote control, *Spacecraft docking, *Teleoperators, Computerized simulation, Human factors engineering, Man machine systems, Visual control.

For abstract, see STAR 1219

N74-30488/2GA PC$23.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
MAN-OPERATOR IN SPACE.
Y. Khrunov, L. Khachaturyants, V. Popov, and Y. Ivanov. Aug 74, 403p NASA-TT-F-15714
Contract NASW-2481
Tran-Transl. Into English of the Book "Chelovek-Operator V Kosmicheskom Polete" Moscow, Mashinostr. Press, 1974 399 p.

Descriptors: *Man machine systems, *Manned space flight, *Operator performance, *Physiological factors, *Psychological factors, Automation, Decision making, Fatigue (Biology), Motivation, Perception, Problem solving, Touch.

For abstract, see STAR 1220

PATENT-3 824 707 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS FOR APPLYING SIMULATOR G-FORCES TO AN ARM OF AN AIRCRAFT SIMULATOR PILOT.
Patent.
B. R. Ashworth, and J. T. Merrill, Iv. Patented 23 Jul 74, 4p PAT-APPL-261 183
Misc-Filed 9 Jun. 1972 Supersedes N72-27271 (10 - 18, p 2407).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Acceleration (Physics), *Aircraft pilots, *Arm (Anatomy), *Flight simulators, Computers, Harnesses, *Patents, Throttling.
Identifiers: PAT-CL-35-12-E.

A device to be used with an aircraft simulator to apply positive and negative g forces to the pilot's arm is described. An arm harness fits around the arm which the pilot uses to operate the throttle. The device allows the harness to track intentional arm movements without exerting any restraining forces, and at the same time, applies g forces to to the pilots arm which are recorded by the aircraft simulator computer.

5I. Personnel Selection, Training, and Evaluation

AD-785 635/4GA PC$3.25/MF$2.25
Army Combat Developments Experimentation Command Fort Ord Calif
NGHT NAP-OF-THE EARTH FLIGHT TRAINING,
Frederick A. Isgrig, and Paul R. Best, Jr. 1973, 15p

Descriptors: *Night warfare, *Flight training, *Helicopters, Tactical aircraft, Attack aircraft, Antitank weapons, Performance, Military requirements, Low altitude, Test methods, Individualized training, Low altitude, Pilots.
Identifiers: Continuous operations.

The paper discusses the exploratory evaluation of training requirements and performance expectations for night tactical operations by conventionally equipped attack helicopter teams. (Modified author abstract)

AD-785 668/5GA PC$3.25/MF$2.25
Army Research Inst for the Behavioral and Social Sciences Arlington Va
DEVELOPMENT OF A TEST BED FOR EVALUATION OF SMALL UNIT DOCTRINAL ALTERNATIVES IN THE COMBAT ARMS,
Robert T. Root, and Larry E. Word. 1970, 16p

Descriptors: *Performance(Human), *Combat readiness, *Small arms, Army training, Rifles, Antitank weapons, Motivation, War games, Teaching methods, Mathematical models.
Identifiers: M-16 guns(5.56mm), M-60 guns(7.62mm), Unit performance assessment model, M-72 rocket launchers(66mm), Realtrain method.

To gain an understanding of human performance in Army jobs it is necessary to study men on the job in a systematic manner in a realistic setting. The reported research program provides a basis for field research and a test bed for simulating the tactical environment. (Modified author abstract)

AD-785 706/3GA PC$3.75/MF$2.25
American Institutes for Research Washington D C
EFFECTS OF ANCILLARY INFORMATION UPON PHOTOINTERPRETER PERFORMANCE,
Jerrold M. Levine, and Donald Eldredge. Sep 74, 27p ARI-Technical paper-255
Contract DAHC19-70-C-0034

Descriptors: *Tactical intelligence, *Information processing, *Photointerpreters, *Performance(Human), Data processing, Computer applications, Surveillance, Target discrimination, Images, Test methods, Reviews, Information systems, Teaching methods.
Identifiers: *Task performance.

The intelligence systems research program has as its objective to improve the Army's capability to process tactical intelligence information through application of current technology in data handling techniques, computer aids, work methods, and information management. The report evaluates the improvement of photointerpretation performance achieved by providing ancillary intelligence information to the photointerpreter. The research is presented in two sections: a reprint from Human Factors, 1972, and an appendix that supplements the journal article with additional detail on the photointerpretation task studied and the methodology employed. (Modified author abstract)

AD-785 845/9GA PC$5.25/MF$2.25
Iowa State Univ Ames Dept of Sociology and Anthropology
LOCAL CIVIL DEFENSE DIRECTORS IN ACTION: SELECTION AND ACTION.
Final rept.,
Charles L. Mulford, Gerald E. Klonglan, Sue Faisal, Joseph P. Kopachevsky, and Dan L. Tweed. Jul 73, 117p Rept no. Sociology-101F
Contract DAHC20-71-C-0272
See also report dated Oct 72, AD-757 642, and report dated Jul 73, AD-785 846.

Descriptors: *Civil defense, *Personnel management, Selection, Surveys, Questionnaires, Training, Emergencies, Management planning.

The report is the last of a five-part series which presents the initial questions and responses of items related to selection and activity obtained from a national sample of local civil defense director/coordinators. The report presents through the use of simple descriptive statistics content areas which include: Methods of selection; opinions concerning the effect of training on completion of tasks, the relative importance of tasks, and the future necessity of training activities; and emergency activities and community support. Secondly, the report also contains the questions, item format, codes utilized in the initial data analysis, and a glossary of statistical terms used in the report. (Author)

AD-785 846/7GA PC$5.25/MF$2.25
Iowa State Univ Ames Dept of Sociology and Anthropology
LOCAL CIVIL DEFENSE DIRECTORS IN ACTION: PERSONAL, ORGANIZATIONAL AND INTERORGANIZATIONAL RESOURCES.
Final rept.,
Gerald E. Klonglan, Charles L. Mulford, Sue Faisal, Dan L. Tweed, and Joseph P. Kopachevsky. Jul 73, 117p Rept no. Sociology-101E
Contract DAHC20-71-C-0272
See also report dated Oct 72, AD-785 845.

Descriptors: *Civil defense, *Personnel management, Training, Emergencies, Efficiency, Management, Disasters, Questionnaires, Organizations.

The report is the fourth in a five-part series which presents the initial questions and responses of items related to Personal, Organizational, and Interorganizational Resources obtained from a national sample of local civil defense directors coordinators. The report presents through the use of simple descriptive statistics content areas which include: Personal characteristics of the local director, organizational characteristics, and the relations of the local Civil Defense organization with other local organizations. (Modified author abstract)

AD-785 892/1GA PC$3.75/MF$2.25
Purdue Univ Lafayette Ind Occupational Research Center
THE UTILITY OF JOB DIMENSIONS BASED ON FORM B OF THE POSITION ANALYSIS QUESTIONNAIRE (PAQ) IN A JOB COMPONENT VALIDATION MODEL.
Final technical rept.,
Lloyd D. Marquardt, and Ernest J. McCormick. Jul 74, 32p Rept no. TR-5
Contract N00014-67-A-0226-0016
See also report dated Jun 74, AD-785 896.

Descriptors: *Job analysis, *Personnel, Validation, Models, Performance(Human), Predictions, Questionnaires, Aptitudes, Information, Attitudes(Psychology), Work, Ratings.
Identifiers: *Position analysis questionnaire, *General aptitude test battery, Attributes.

The study involved the use of a structured job analysis instrument called the Position Analysis Questionnaire (PAQ) as the direct basis for the establishment of the job component validity of aptitude tests (that is, a procedure for estimating the aptitude requirements for jobs strictly on the basis of job analysis data). The sample of jobs used consisted of 658 jobs for which PAQ analyses were available that were 'matched' with 141 jobs for which the United States Training and Employment Service had published test data for job incumbents for the 9 tests of the General Aptitude Test Battery (GATB). Job dimension scores (based on principal components analyses of PAQ data) were derived for the 658 jobs, and were used as predictors. The criteria were developed for each of the 141 'matched' jobs, these being based on the scores of the job incumbents, on the 9 tests. These were: (1) mean test score: (2) a score one standard deviaiton below the mean (called a potential cutoff score); and (3) a validity coefficient. (Modified author abstract)

AD-785 896/2GA PC$3.75/MF$2.25
Purdue Univ Lafayette Ind Occupational Research Center
THE JOB DIMENSIONS UNDERLYING THE JOB ELEMENTS OF THE POSITION ANALYSIS QUESTIONNAIRE (PAQ) (FORM B).
Final technical rept.,
Lloyd D. Marquardt, and Ernest J. McCormick. Jun 74, 47p Rept no. TR-4
Contract N00014-67-A-0226-0016
See also report dated Sep 73, AD-770 152.

Descriptors: *Job analysis, *Questionnaires, Aptitudes, Environments, Information, Attitudes(Psychology), Work, Interactions, Ratings.
Identifiers: *Position analysis questionnaire, Attributes.

The study was concerned with the identification of the job dimension underlying the job elements of the Position Analysis Questionnaire (PAQ), Form B. The PAQ is a structured job analysis instrument consisting of 187 worker-oriented job elements which are divided into six a priori major divisions. The statistical procedure of principal components analysis was used to identify the job dimensions of the PAQ. Forty-five job dimensions were identified through 8 separate component analyses of a sample of 3700 PAQ analyses which had been stratified roughly in proportion to the occupational composition of the American labor force. Thirty-one of these dimensions resulted from 7 independent analyses using, in each case, only the job elements from one of the major divisions of the PAQ. The remaining 14 dimensions resulted from an overall analysis in which all of the PAQ job elements were used simultaneously. (Modified author abstract)

AD-785 900/2GA PC$3.75/MF$2.25
Bolt Beranek and Newman Inc Cambridge Mass
COMPARISON OF TWO TEACHING STRATEGIES IN COMPUTER-ASSISTED INSTRUCTION.
Semi-annual rept. 1 Feb-31 Jul 74,
Allan M. Collins. Sep 74, 42p* Rept nos. BBN-2885, TR-3
Contract N00014-71-C-0228, ARPA Order-2284

Descriptors: *Computer aided instruction, *Teaching methods, Computer applications, Programmed instruction, Memory(Psychology), Learning, Test construction(Psychology), Students.

Three experiments were run using the SCHOLAR CAI system to teach geography to high-school students. The experiments compared a method of teaching derived from analysis of human tutors (Tutorial Mode) vs. a method derived from programmed instruction (Block-Test Mode). In the three experiments, Block-Test Mode was systematically converged toward Tutorial Mode in order to pinpoint what aspects of teaching strategy affected student's learning. Tutorial Mode was significantly more effective in the first two experiments, and nonsignificantly in the third. (Modified author abstract)

AD-785 926/7GA Reprint
Wacline Inc Dayton Ohio
SERIAL LEARNING: A MULTILEVEL ACCESS ANALYSIS.
Interim rept.,

Edwin Martin. 8 Oct 73, 11p AFOSR-TR-74-1484
Contract F44620-72-C-0019
Revision of report dated 30 Aug 73.
Availability: Pub. in Memory and Cognition, v2 n2 p322-328 1974.

Descriptors: *Recall, *Learning, Memory(Psychology), Retention(Psychology), Test methods, Word association.
Identifiers: *Serial learning.

The purpose of this paper is to report new information on how serial learning works. In Experiment I the lists were 36 and 48 unrelated words. Each was divided into successive groups of four words and learned to a perfect criterion. In Experiment II the lists were made up of six categorical groups of five exemplars each. Degree of learning was varied. In both experiments serial anticipation learning was followed by ordinary free recall and free recall under speed stress. Analyses of acquisition and of both recall tests indicate that group access is a marked function of serial position but that within-group retrieval given group access is constant over serial position. It is argued that serial learning proceeds simultaneously at different levels of representation. (Author)

AD-785 954/9GA PC$6.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE UNIONIZATION OF AIR NATIONAL GUARD TECHNICIANS AND ITS IMPACT ON LABOR-MANAGEMENT RELATIONS.
Master's thesis,
Francis W. A'Hearn, and Russell L. Weaver. Aug 74, 151p Rept no. SLSR-10-74B

Descriptors: *Labor unions, *National Guard, Air force personnel, Technicians, Civilian personnel, Employee relations, Fringe benefits, Legislation, Management, Theses.

Following a comprehensive review of Federal unionism history, this study focuses on the specific introduction of unions into the Air National Guard, the movement's growth, and the impact that growth has has on managers and technicians by examining various indicators and grievance issues reaching the national level for resolution. Recent developments in the Federal labor relations field are reviewed in light of legislation before Congress and the authors conclude that such laws may soon replace existing Executive Orders. The study ends with specific predictions regarding the future of labor relations in the National Guard and the entire Federal sector, along with a discussion of the 'right to strike' issue. (Modified author abstract)

AD-786 004/2GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
FORECASTING PERSONNEL REQUIREMENTS BY A GRAPHANALYTICAL METHOD,
L. Fatkin. 26 Aug 74, 12p Rept no. FTD-HC-23-2362-74
Edited trans. of mono. from Sovet Ekonomicheskoi. Vzaimopomoshchi. Postoyannaya Komissiya po Koordinatsii Nauchnykh i Tekhnicheskikh Issledovanii. Teoriya i Praktika Prognozirovaniya Razvitiya Nauki i Tekhniki v Stranakh-Chlenakh Sev, n.p., 1971 p270-274.

Descriptors: *Personnel management, Requirements, Forecasting, Graphics, Industrial personnel, Translations, USSR.

AD-786 040/6GA PC$5.25/MF$2.25
Human Resources Research Organization Alexandria Va
A THEORETICAL BASIS FOR INDIVIDUALIZED INSTRUCTION.
Final rept. Mar-Nov 73,
Edward H. Kingsley, and John Stelzer. Jul 74, 122p Rept no. HumRRO-TR-74-7 AFHRL-TR-74-10
Contract F41609-73-C-0020

Descriptors: *Computer aided instruction, *Individualized training, Theory, Learning, Military training, Instructional materials, Set theory, Mathematical models, Mathematical logic, Students.

This research was designed to formulate a theoretical basis for a model of individualized instruction. The theory is semi-axiomatic in nature so that the definitions and assumptions used are stated explicitly. Set theory and symbolic logic are the conceptual tools used. The model includes theories of subject-matter structure and student state description. These are related by an overall instructional model. A main result shows how subject-matter structure constrains student state transitions through a subject matter. An application of the subject-matter theory is made to an existing Air Force course. A number of open problems are given whose further investigation would help make the model a more practical instructional tool. (Author)

AD-786 041/4GA PC$5.25/MF$2.25
Applied Psychological Services Wayne Pa
A SURVEY OF STUDENT MEASUREMENT AND COURSE EVALUATION PROCEDURES WITHIN THE AIR TRAINING COMMAND.
Final rept.,
Arthur I. Siegel, Philip J. Federman, and Wayne S. Sellman. Jul 74, 116p AFHRL-TR-74-5
Contract F41609-71-C-0025

Descriptors: *Teaching methods, *Courses(Education), Air Force training, Instructors, Students, Proficiency, Learning, Test methods, Assessment, Interviewing, Surveys.

The methods, procedures, and results of an interview survey into reactions of user personnel to the Air Force Instructional System Development (ISD) system are reported. Training evaluation, student measurement, and training manager/instructor personnel were interviewed. All groups regarded the ISD procedures favorably, but some problems associated with the ISD procedures were identified. Recommendations for ISD program improvement are presented. The results of an interview survey of the Air Training Command to clarify issues relating to training evaluation and student measurement are reported. The survey was also concerned with a general assessment of the use and application of the Instructional System Development technique. (Modified author abstract)

AD-786 042/2GA PC$5.25/MF$2.25
Human Resources Research Organization Alexandria Va
AUDING AND READING: A DEVELOPMENTAL MODEL.
Final rept. Apr 73-Jan 74,
Thomas G. Sticht, Lawrence J. Beck, Robert N. Hauke, Glenn M. Kleiman, and James H. James. Jul 74, 115p AFHRL-TR-74-36
Contract F41609-73-C-0025

Descriptors: *Reading, *Hearing, Skills, Training, Language, Auditory perception, Speech, Intelligibility, Computer aided instruction, Air Force training.
Identifiers: Comprehension, Literacy.

The report describes an auding/reading model that accounts for the development of receptive oracy and literacy skills. The model presents a classification scheme for the development of reading and auding skills which considers basic adaptive processes, languaging precursors, and languaging processes. Four hypotheses consistent with the model were derived: (1) the ability to comprehend language by auding will surpass ability to comprehend language by reading during early school years, until reading skill is acquired--following which time the ability to comprehend by auding and reading will become equal; (2) performance on measures of ability to comprehend language by auding will be predictive of performance on measures of ability to comprehend language by reading, after reading skill is acquired; (3) performance on measures of reading rate and auding rate will be comparable, after reading decoding skill has been developed; and (4) training in comprehending by auding will transfer to reading, after reading skill is acquired. An extensive literature review of empirical data bearing on the model supported each of the four hypotheses. (Modified author abstract)

AD-786 202/2GA PC$3.75/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
ELECTRONIC WARFARE SYSTEMS REPAIR CAREER LADDER AFSC 32833, 32853, 32873, 32894.
Occupational survey rept.
1 Sep 74, 44p Rept no. AFPT-90-328-219

Descriptors: *Air Force personnel, *Electronic warfare, *Maintenance personnel, *Job analysis, Surveys, Avionics, Theory, Operation, Repair, Methodology, Classification, Personnel management, Standards, Air Force equipment.
Identifiers: *Career ladders.

The subject career ladder provides installation, maintenance, repair and inspection of the large variety of electronic warfare (EW) systems used within the Air Force. As in other avionic career ladders the basic skills and knowledges required of personnel in this ladder are electronic theories and principles as they relate to the operation, maintenance, repair and inspection of EW systems. Subject areas investigated and reported on include the identification and description of functional job types and the career field structure, comparison of duties and tasks, the relation of duties and tasks with the specialty training standard (STS), and related data.

AD-786 203/0GA PC$4.25/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
AVIONIC SENSOR SYSTEMS CAREER LADDER AFSCS 32930A/B, 32950A/B, 32970A/B, AND 32990.
Occupational survey rept.
15 Jul 74, 67p Rept no. AFPT-90-329-130

Descriptors: *Air Force personnel, *Careers, *Avionics, Electronic equipment, Detection, Job analysis, Specialists, Classification, Training, Maintenance.
Identifiers: *Electronic sensor systems personnel, *Career ladders.

The Avionic Sensor Systems career ladder (AFSC 329XOA/B) provides flight line and shop maintenance on electronic sensor systems (A shred) and electro-optical (E-O) sensor systems (B shred). The electronic sensor systems include the infrared detecting systems (IRDS), side looking radar (SLR) systems, low light level television (LLLTV) systems, laser systems and data display sets (DDS). The E-O sensor systems include cameras, mounts, viewfinders, etc. Both shreds also maintain the AGE and test sets associated with the systems they maintain. Personnel of both shreds perform specified types of tasks on the systems/AGE for which they are responsible.

AD-786 204/8GA PC$4.25/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
AIRCRAFT CONTROL AND WARNING REPAIRMAN CAREER LADDER AFSC 30332, 30352, 30372, AND 30393.
Occupational survey rept.
15 Aug 74, 62p Rept no. AFPT-90-303-080

Descriptors: *Air Force personnel, *Aircraft maintenance, *Job analysis, Surveys, Personnel management, Manpower utilization, Difficulty, Classification, Warning systems, Control systems, Radar equipment, Supervision.
Identifiers: *Career ladders.

The survey was undertaken to determine the adequacy of the aircraft control and warning career field structure. The career field was broken down into job groups based on tasks performed. Thirteen job clusters and 35 job types were identified. The difficulty of individual tasks and jobs was investigated. A wide range of both was observed. An analysis of task performance and its relationship with experience is reported on.

AD-786 205/5GA PC$5.25/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
SPECIAL SERVICES CAREER LADDERS AFSC 74130, 74150, 74131, 74151, 74171, AND 74191.
Occupational survey rept.
20 Aug 74, 101p Rept no. AFPT-90-741-135

Descriptors: *Air Force personnel, *Careers, *Job analysis, Surveys, Specialists, Supervisors, Maintenance personnel, Classification, Recreation, Attitudes(Psychology), Skills.
Identifiers: *Special services personnel, *Career ladders, Survey instruments, Athletics, Recommendations.

The report describes an occupational survey of the Special Services Career Ladders 741X0 and 741X1. This occupational survey was conducted by the Occupational Survey Branch, USAF Occupational Measurement Center, from February 1973 to July 1974. The report describes the development of the survey instrument, its administration to job incumbents in athletics and recreation, and resulting summaries of tasks performed by airmen grouped by skill level, experience level, and similarity of tasks performed. Job and task difficulty is also discussed. Results are compared with current training documents and recommendations for areas of further study are presented.

AD-786 206/3GA PC$4.25/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
STEWARD SPECIALIST CAREER LADDER AFSCS 74230, 74250, 74270, AND 74290.
Occupational survey rept.
20 Aug 74, 62p Rept no. AFPT-90-742-117

Descriptors: *Air Force personnel, *Careers, *Job analysis, Surveys, Inventory, Background, Classification, Personnel management, Research management, Statistical data, Skills, Specialists.
Identifiers: *Career ladders, *Stewards.

The report describes an occupational survey of the Steward Specialist Career ladder, AFS 742X0, conducted by the Occupational Survey Branch, USAF Occupational Measurement Center, from January 1973 through July 1974. The report describes the development of the survey instrument, its administration to job incumbents, and resulting summaries of tasks performed by airmen grouped by skill level, experience level, and similarity of tasks performed. Results are compared to current training and career field structure documents and recommendations for further study are presented.

COM-74-11530/4GA PC$4.75/MF$2.25
Maritime Administration, Washington, D.C. Office of Maritime Manpower.
DECK AND ENGINE OFFICERS IN THE U.S. MERCHANT MARINE SUPPLY AND DEMAND, 1974-1984.
Final rept.,
Peter J. Luciano. May 74, 80p* MA-GEN-510-70008

Descriptors: *Manpower, *Merchant ships, *Officer personnel, Qualifications, Forecasting, Mathematical models, Employment, Requirements.

The study is the third in a continuing series to provide industry and government with information needed for effective manpower planning. The results of the third study suggest that if current trends continue, a shortage of both deck and engine officers is likely before the end of this decade. Because of the sensitivity of this conclusion to various assumptions made in the study, the analysis will continue on a regular basis, as new data become available, in order to check the validity of the current results and to update other information needed for planning purposes.

COM-74-11571/8GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
PRODUCTIVITY. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sep 74,
Edward J. Lehmann. Oct 74, 142p* NTIS/WIN-74/080

Descriptors: *Productivity, *Manpower utilization, *Bibliographies, Economic analysis, Management planning, Personnel development, Performance evaluation, Output, Job satisfaction, Employment, Performance(Human), Industrial training, Work measurement, Job analysis, Incentives, Demand(Economics), Motivation.

The bibliography contains 126 selected abstracts of research reports retrieved using the NTIS online search system--NTISearch. Included are studies on the sources of productivity change, industry breakdowns, effects of job improvement, personnel management to increase productivity, and the relationship of productivity to the economy as a whole.

COM-74-50917/5GA PC-GPO/MF$2.25-NTIS
Patent Office, Washington, D.C.
ATTORNEYS AND AGENTS REGISTERED TO PRACTICE BEFORE THE U.S. PATENT OFFICE -- 1974.
Jun 74, 286p PAT-014.1-7305
Paper copy available from GPO $3.25.

Descriptors: *Personnel, *Directories, Government employees, Patent laws.
Identifiers: Patent Office, *Patent agents, *Attorneys.

The publication is composed of two parts: In the first part of the publication, individual attorneys and agents in the United States and foreign countries are arranged alphabetically in a list by surname. The second part of the publication is a geographical listing alphabetically arranged by state and zip code, of patent attorneys and agents in the U.S. Attorneys and agents having offices elsewhere than in the United States are listed alphabetically by country and city, following the U.S. listing.

PB-234 677/3GA PC$3.25/MF$2.25
West Virginia Div. of Vocational Rehabilitation, Charleston.
A GUIDE FOR PSYCHOLOGIST; PROVISION OF VOCATIONAL SERVICES TO CLIENTS OF DIVISIONS OF VOCATIONAL REHABILITATION.
Final rept.,
William R.Phelps. Aug 74, 22p
Grant SRS-44-15092

Descriptors: *Vocational interests, *Rehabilitation, *Management guidelines, Manuals, Services, Social psychology, Personnel management, Organizational effectiveness Data processing, Information systems, Planning, Evaluation, Tests, West Virginia.
Identifiers: *Vocational rehabilitation.

The guide is prepared for the psychologist providing psychological services to divisions of vocational rehabilitation and covers psychological assessment, including clinical as well as intellectual spheres. Areas receiving special emphasis include basic assumptions, referral reasons, findings and reporting, impressions and recommendations. The material should be helpful to rehabilitation practitioners utilizing psychological services.

PB-235 036/1GA PC$15.00/MF$15.00
Urban Inst., Washington, D.C.
PUBLIC SCHOOL FINANCE: PRESENT DISPARITIES AND FISCAL ALTERNATIVES,
Betsy Levin, Thomas Muller, William J. Scanlon, and Michael Cohen. Jul 72, 545p* UI-727-3, URI-35000
Also pub. as Rept no ISBN-87766-025-5.

Descriptors: *Schools, *Financing, *Public administration, State programs, Reviews, Revenue, Expenditures, Tax structure, Distributing, Comparative studies, Statistical analysis, Hawaii, Delaware, North Carolina, Washington(State), Colorado, California, Michigan, New York, New Hampshire.
Identifiers: Alternatives.

The report prepared for the President's Commission on School Finance has been revised to include new data and expanded analysis. The authors examine public education support programs in nine states-Hawaii, Delaware, North Carolina, Washington, California, Michigan, New York, New Hampshire, and Colorado-ranging (in that order) from full state funding to low state funding. Revenues and expenditures are compared from interstate and intrastate perspectives. Alternative taxing and distribution formulas are analyzed to show which kinds of districts, taxpayers, and pupils would gain or lose as compared with existing finance systems.

PB-235 212/8GA PC$4.25/MF$2.25
Phoenix Products, Inc., North Hollywood, Calif.
PROPRIETARY ITEMS AND REHABILITATION WORKSHOPS.
Final rept. 22 Sep 68-31 May 72,
Vicente Velez, James W. Chaddick, and Ann Dempsey. 31 May 72, 52p*
Grant SRS-RD-45-6927-G, SRS-12-55278

Descriptors: *Rehabilitation, *Handicapped workers, Marketing, Design, Product development, Sales management, Quality control.

The report describes a project for the design and development of consumer products to be produced in workshops for the handicapped, and the distribution of such products through commercial marketing channels in an attempt to increase the kind, sources and amount of work programs of rehabilitation workshops.

PB-235 231/8GA PC$3.75/MF$2.25
Illinois Univ., Urbana. Dept. of Psychology.
ORAL VS. WRITTEN PRESENTATIONS OF INDUSTRIAL ACCULTURATION MATERIALS TO UNEMPLOYED BLACK MALES.
Technical rept.,
A. Kent Rissman, and James J. Jaccard. Aug 73, 35p TR-19
Grant SRS-15-55175
Report on Illinois Studies of the Economically Disadvantaged.

Descriptors: *Disadvantaged minorities, *Training programs, Roles(Behavior), Social communication, Sensitivity, Literacy, Negroes, Manuals, Instructions, Rehabilitation, Hardcore unemployed.
Identifiers: Culture assimilators.

The paper examines the relative advantages of oral vs written presentations of the training materials with unemployed black males. To improve the chances of a disadvantaged employee staying on a job, the authors have developed two kinds of training materials. One set of materials, called 'culture assimilators' for interaction with the economically disadvantaged, is designed for the training of supervisors. The other culture assimilator, designed for the training of black ghetto residents, is of particular concern in the present report.

PB-235 276/3GA PC$9.25/MF$2.25
Westat, Inc., Rockville, Md. Research Div.
FOLLOW-UP SURVEY OF NATIONAL CANCER INSTITUTE GRADUATE RESEARCH TRAINEES.
Final rept.,
George K. Schueller, and Thomas W. McKenna.
Aug 73, 322p NIH-NCI-72-2
Contract PHS-0-72-3891

Descriptors: *Cancer, *Medical research, *Training programs, Surveys, Students, Education, Interviewing, Questionnaires.
Identifiers: National Cancer Institute Graduate Traineeship Program, *Training program graduates.

The project consisted of a mail survey of former and present participants of the NCI (National Cancer Institute) Graduate Traineeship Program. Individuals (predoctorals, M.D.'s and Ph.D.'s) were selected to be interviewed. The response rate was approximately 75%. Information received through the survey shows present activities of the trainees, cancer-related activities most frequently reported, amount of professional time spent in research or teaching in educational institutions, and number and type of scientific publications per trainee.

PB-235 710/1GA PC$4.25/MF$2.25
George Washington Univ., Washington, D.C. School of Medicine.
A STUDY OF INDIVIDUAL ACCESS OF AUDIOTAPES AND 35MM SLIDE VISUAL SUPPORT IN FRESHMAN MEDICAL STUDENT LEARNING.
Final rept.,
Frank D. Allan. 28 Feb 74, 68p LHNCBC-75-02
Contract PH-71-4708

Descriptors: *Students, *Visual aids, *Medical personnel, *Education, Magnetic tapes, Sound systems, Film slides, Learning, Performance evaluation, Universities.
Identifiers: *Individualized training.

Through the duration of three classes of freshman medical students, and primarily in the area of anatomy lecture sessions, audiotaped lectures were made available to all students on demand. Cassette tapes were provided in a choice of playback at normal date of speech or in a (temporarily) compressed speech rate. Filmstrip visuals were inexpensively produced via a unique rapid technique to accompany selected lecture tapes. Results of the study in this case indicated that use of readily available audiovisual materials provided significant support for learning for approximately 25% of the students involved.

PB-235 714/3GA PC$7.25/MF$2.25
Technical Education Research Centers, Inc., Champaign, Ill. Midwest Center.
TRAINING STATE AND COMMUNITY CURRICULUM PACKAGES: DRIVER IMPROVEMENT ANALYSIS, DRIVER LICENSE EXAMINER-SUPERVISOR AND TRAFFIC RECORD ANALYSIS.
Final rept, 29 Jun 73-30 Jun 74,
V. E.Burgener, and Dona Tiryakioglu. Aug 74,
218p DOT-HS-801 203
Contract DOT-HS-100-3-738

Descriptors: *Instructors, *Training programs, *Motor vehicle operators, Personnel development, Specialized training, Traffic safety, Workshops.
Identifiers: Instructional materials, Driver education, Curricula.

A series of five national instructor training institutes were planned for each of three emerging highway safety technician areas for which curriculum packages have been prepared (Driver Improvement Analysis; Driver License Examiner-Supervisor; and Traffic Record Analysis). Technical Education Research Centers and Dunlap & Associates collaborated to conduct the institutes from October 15 to December 14, 1973. The report contains detailed information on successful operation of Manpower Training Institutes for NHTSA.

PB-235 851/3GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
COMPUTER SYSTEM RESOURCE REQUIREMENTS OF NOVICE PROGRAMMING STUDENTS.
Final rept.,
Gary J. Nutt. Feb 74, 32p* CU-CS-039-74
Grant NSF-GJ-660

Descriptors: *Computer technology, *Education, *Universities, Recommendations, Minicomputers, Programmed instruction, Optimization, Computer programming, Time, Benefit cost analysis, Students, FORTRAN.
Identifiers: *Lower level courses.

The characteristics of jobs that constitute the mix for lower division FORTRAN classes in a university are investigated. Samples of these programs are also benchmarked on a large central site computer and two minicomputer systems. The conclusion of this study is that a carefully chosen minicomputer system could offer service at least the equivalent of the service provided by the central site system, and that certain aspects of this service could be distinctly better.

PB-235 916/4GA PC$10.25/MF$2.25
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
HANDBOOK FOR DRIVING KNOWLEDGE TESTING.
Final rept. Jul 70-Sep 73,
William T. Pollock, and Thomas L. McDole. Aug 74, 391p* HSRI-001590-3 DOT-HS-801 178

Descriptors: *Motor vehicle operators, *Achievement tests, *Handbooks, Regulations, Vehicular traffic control, Licenses, Traffic safety.
Identifiers: Driver education.

Materials intended for driving knowledge test development for use by operational licensing and education agencies are presented. A pool of 1,313 multiple choice test items is included, consisting of sets of specially developed and tested items covering principles of safe driving, legal regulations, and traffic control device knowledge pertinent to passenger car and light truck operation. Statistical and normative data from testing Iowa driver education, students, Coast Guard recruits, and Michigan driver license applicants are provided with the items.

PB-235 938/8GA PC$3.75/MF$2.25
West Virginia Div. of Vocational Rehabilitation, Charleston, Program Development Section.
USE OF OCCUPATIONAL INFORMATION IN VOCATIONAL REHABILITATION. CASE STUDY MATERIAL FOR THE VOCATIONAL REHABILITATION COUNSELOR.
Final rept.,
William R. Phelps. Sep 74, 27p
Grant SRS-44-15092
*Social Rehabilitation Service, Washington, D.C.

Descriptors: *Rehabilitation, *Vocational guidance, Counseling, Personnel development.
Identifiers: *Vocational rehabilitation, Physically handicapped persons, Mentally handicapped persons.

The information presents case study material for six clients and shows one approach: how the vocational rehabilitation counselor can effectively utilize occupational information. Disabilities include visual, orthopedic, cardiac, speech, mental retardation, and diabetes-orthopedic. Psychological test data for each client are presented, along with background information, and salient discussion questions. (Modified author abstract)

PB-236 333/1GA PC$3.75/MF$2.25
Georgia Div. of Vocational Rehabilitation, Atlanta.
EXPERIMENTAL DEMONSTRATION PROJECT FOR SERVING SELECTIVE SERVICE REJECTEES.
Final rept. 1 Jul 64-30 Jun 67.
1970, 32p SRS-RD-1658-001
Grant SRS-RD-1658-G

Descriptors: *Vocational training, *Rehabilitation, Military personnel, Rejection, Counseling, Project management.

The project attempted to rehabilitate selective service rejectees both psychologically and vocationally. Through extensive screening, testing, and interviews, rejectees received training, attended technical schools and colleges, and received restorative medical treatment. Bibliography and appendices are included.

TT-73-56029 PC$3.25/MF$2.25
Office of Education, Washington, D.C.
EARLY CHILDHOOD EDUCATION IN YUGOSLAVIA: A SPECIAL ISSUE OF SELECTED BIBLIOGRAPHY OF YUGOSLAV EDUCATIONAL MATERIALS.
1974, 25p
Trans. of articles from various Yugoslavian journals, by Roger Cowan. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Education, *Yugoslavia, *Children, *Bibliographies, Schools, Social welfare, Legislation, Organizations, Management methods.
Identifiers: *Preschool children, *Kindergartens, Child care, Nursery schools.

Materials are presented on preschool children, kindergartens, and nursery school adminstration in Yugoslavia.

5J. Psychology (Individual and Group Behavior)

AD-785 639/6GA PC$3.25/MF$2.25
Army Research Inst for the Behavioral and Social Sciences Arlington Va
MULTISTAGE INFERENCE MODELS FOR INTELLIGENCE ANALYSIS,
Edgar M. Johnson, and Stanley M. Halpin. 1974, 15p

Descriptors: *Intelligence, *Psychological tests, *Information processing, Bayes theorem, Mathematical models, Matrices(Mathematics), Behavior, Uncertainty, Reliability, Test methods, Performance(Human), Computer applications.
Identifiers: *Intelligence analysis, Inference, Multistage models.

The report discusses inference models which provide a potentially meaningful and useful framework for the analysis of current modes of intelligence processing. The paper describes the development and evaluation of a class of multistage Bayesian inference models. (modified author abstract)

AD-785 868/1GA PC$4.75/MF$2.25
American Institutes for Research Silver Spring Md
METHODS FOR PREDICTING JOB-ABILITY REQUIREMENTS: II. ABILITY REQUIREMENTS AS A FUNCTION OF CHANGES IN THE CHARACTERISTICS OF AN ELECTRONIC FAULT-FINDING TASK.
Technical rept. 15 Mar-31 Dec 73,
Andrew M. Rose, Paul W. Fingerman, George R. Wheaton, Ellen Eisner, and Gloria Kramer. Aug 74, 94p* Rept nos. AIR-R74-6, AIR-31300-8/74-TR
Contract N00014-72-C-0382
See also report dated Sep 73, AD-769 073.

Descriptors: *Aptitude tests, *Performance(Human), Faults, Identification, Jobs, Predictions, Reasoning, Employment, Test construction(Psychology), Students.
Identifiers: Abilities, Task performance.

The report describes the second study in a program of research dealing with the relationships between the characteristics of human tasks and the abilities required for task performance. The goal of the program is to generate principles which can be used to identify ability requirements from knowledge of the characteristics of a task and of variations in the conditions of task performance. The present study investigated the relationship between variations in an electronic fault-finding task and consequent changes in the abilities related to fault-finding performance. Characteristics of the fault-finding task were manipulated by varying formal difficulty and perceptual complexity. Subjects received a battery of reference ability tests and then proceeded to perform the criterion task under the different experimental conditions. To determine the relationship between task characteristics and ability requirements, the reference battery was factor analyzed to identify a reference ability structure. The loadings of the various criterion task conditions on that structure were then estimated. (Modified author abstract)

AD-785 922/6GA Reprint
Michigan Univ Ann Arbor Human Performance Center
LEVELS OF ANALYSIS IN MOTOR CONTROL.
Interim rept.,
Richard W. Pew. 1974, 11p AFOSR-TR-74-1483
Contract F44620-72-C-0019
Text in English; Summary in French.
Availability: Pub. in Brain Research, v71 p393-400 1974.

Descriptors: *Motor reactions, Learning, Memory(Psychology), Behavior, Psychophysiology, Performance(Human), Humans, Experimental data.
Identifiers: Neurophysiology.

The analysis of skilled performance must proceed at many levels. As illustrated in the two experiments presented, what was observed in human skilled behavior is the rich intermingling of these various levels of control as a function of the task demands, the state of learning of the subject and the constraints imposed on the task and the subject by the environment. The job of the researcher is different depending on the level of analysis at which he is interested, but a general theory of skill acquisition will only result from consideration of the ramifications of a multi-level process-oriented description of skilled performance. (Modified author abstract)

AD-786 048/9GA Reprint
Human Engineering Lab Aberdeen Proving Ground Md
EFFECT OF CLICK INTENSITY ON ROUND-WINDOW POTENTIALS IN CATS.
Final technical memo.,
Lynn C. Oatman, and Kenneth D. Marvel. Sep 74, 8p Rept no. HEL-TM-19-74
Availability: Pub. in Jnl. of Auditory Research, v12 p208-211 1972.

Descriptors: *Auditory nerve, Stimuli, Response(Biology), Cats, Experimental data, Electrophysiology, Psychophysiology, Hearing, Auditory perception.
Identifiers: Cochlear microphonics, Cochlear nucleus.

Electrophysiological coding of intensity in the periphery of the auditory system is even today not fully understood. The role of the cochlear microphonic (CM) is still debated, while the shapes of the input-output functions of first-order auditory neurons (e.g. N1) show considerable variability. The N1 intensity functions of some animals are monotonic, some exhibit a two-stage growth in amplitude with increasing stimulus intensity. This study determined the intensity function of N1 in response to clicks. (Author)

AD-786 049/7GA Reprint
Human Engineering Lab Aberdeen Proving Ground Md
SHORT-TERM RETENTION OF VISUAL SEQUENCES AS A FUNCTION OF STIMULUS DURATION AND ENCODING TECHNIQUE.
Final technical memo.,
John G. Miscik, and Kenneth A. Deffenbacher. 2 Nov 73, 6p Rept no. HEL-TM-17-74
Availability: Pub. in Jnl. of Experimental Psychology, v103 n1 p188-190 1974.

Descriptors: *Memory(Psychology), *Coding, Retention(Psychology), Recall, Information processing, Auditory perception, Visual perception.
Identifiers: Visual information processing, Auditory information processing, Information processing(Psychology).

An earlier study had concluded that facilitation of short-term recall for auditory digit sequences by increases in digit duration were due to increased rehearsal time available under these conditons, and that this extra rehearsal time was more facilitative at longer rather than at shorter retention intervals; and efficient encoding techniques improved recall regardless of retention interval length. The present study not only confirmed these conclusions for a situation where digit sequences received both a visual and an auditory encoding but also determined that the digit duration which is critical in terms of allowing significantly more rehearsal time is between .5 and 1 second. (Author)

AD-786 050/5GA Reprint
Human Engineering Lab Aberdeen Proving Ground Md
CUTANEOUS PERCEPTION OF HEROIN ADDICTS: EVIDENCE OF AN ALTERED TEMPORAL PROCESS.
Final technical memo.,
Richard A. Monty, Robert J. Hall, and Marjorie A. Rosenberger. 4 Feb 74, 7p Rept no. HEL-TM-16-74
ARPA Order-2128
Availability: Pub. in Bulletin of the Psychonomic Society, v3 (5A) p352-354 1974.

Descriptors: *Heroin, *Perception, *Touch, Senses(Physiology), Skin(Anatomy), Central nervous system, Drugs, Physiological effects, Excitation.

The time taken to detect the direction of movement of a stylus drawn across the volar surface of the forearm is greater for heroin addicts than for nonaddicts. The slower the speed of movement of the stylus, the greater the difference. Perception of nontemporally related dimensions is not affected, indicating that the effects of heroin appear to be highly specific, and alter the central nervous system's temporal processes which govern and regulate excitability cycles and cortical scanning. (Author)

AD-786 051/3GA Reprint
Human Engineering Lab Aberdeen Proving Ground Md
LACK OF APPETITIVE AROUSAL EFFECTS ON AUDITORY EVOKED POTENTIALS.
Final technical memo.,
Lynn C. Oatman. 19 Mar 73, 9p Rept no. HEL-TM-15-74
Availability: Pub. in Jnl. of Comparative and Physiological Psychology, v86 n6 p1110-1115 1974.

Descriptors: *Food deprivation, *Auditory nerve, *Cerebral cortex, Auditory perception, Electroencephalography, Brain, Nervous system, Physiology, Psychophysiology, Hearing, Cats, Experimental data.
Identifiers: Cochlear nucleus, *Neurophysiology, Cochlear microphonics.

Click-evoked potentials were recorded from the round window (cochlear microphonic and auditory nerve), cochlear nucleus, and auditory cortex of cats during periods of food deprivation. At all sites, the amplitude of the click-evoked potentials remained constant as deprivation time increased from 0 hr. to 24 hr. In addition, increased food deprivation time had no systematic effect on electroencephalogram (EEG) activity recorded from the auditory cortex for either the high-voltage/low-frequency (2-10 Hz.) or the low-voltage/high-frequency (18-30 Hz.) wave patterns. Since the food deprivation procedure used did not produce a state of heightened EEG arousal, the most likely explanation for the lack of effect on auditory evoked potentials was that neural events which may result in attenuation of auditory evoked potentials were not initiated. (Author)

JPRS-L/5022-2 PC$7.50
Joint Publications Research Service, Arlington, Va.
PROCEEDINGS OF THE CONFERENCE ON PSYCHOTRONIC RESEARCH (1ST) HELD IN PRAGUE IN 1973. PART II.
6 Sep 74, 227p
Trans. from Konference O Vyzkumu Psychotroniky (1st), Prague. Papers, n.p., 1973, pt2 401p. Paper copy available to U.S. Government recipients only.

Descriptors: *Meetings, *Parapsychology, *Psychophysiology.

Contents:
- The nature of the extreme value of skin potentials at acupuncture points;
- Man–plant communication experiments;
- Interpretation of dowsing reactions;
- The enigmatic status of radionics in the Unites States;
- Simultaneous function of both hemispheres of the human brain;
- A genetic hypothesis for parapsychology: postulating psi-genes;
- Erasure of subconscious mind;
- Studies of psi-facilitating states: hypnosis, muscular relaxation, and an experimentally induced hypnagogic state;
- Possibility of utilizing psychotronics in creative activity while substituting the information factor for the factor of randomness;
- Contributions to a method and a technique for the development of extrasensory perception;
- Some recent english publications on psychotronics;
- Purposive activation of mental activity in the learning process.

JPRS-62919 PC$5.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
PSYCHOLOGY OF THE RADAR OPERATOR UNDER COMBAT CONDITIONS,
V. I. Kovalev. 9 Sep 74, 114p
Tran. of mono. Psikhologiya Boevoi Aktivnosti Operatora, Moscow, 1974 141p.

Descriptors: *Military psychology, *Military training, *Radar operators, Combat readiness, Stress psychology, Performance standards, Motivation, Emotions, Stability, USSR, Translations.

The report contains an examination of the problem of performance under combat conditions on the basis of experience in training radar operators.

N74-29464/6GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
FIELD OF VISION AND SIMPLE REACTION TIME DURING RECREATION EXERCISES AT WORK.
T. Mieczkowski, and S. Rotenberg. Jul 74, 13p
NASA-TT-F-15828
Contract NASW-2481

Tran-Transl. Into English from Wychowanie Fizyczne Sport (Poland), V. 9, No. 4, 1965 p 413-418.

Descriptors: *Exercise (Physiology), *Operators (Personnel), *Reaction time, Color, Light (Visible radiation), Perception.

For abstract, see STAR 1219

PB-235 228/4GA PC$7.25/MF$2.25
Illinois Univ., Champaign. Dept. of Psychology.
CULTURE ASSIMILATOR: FOR INTERACTION WITH THE ECONOMICALLY DISADVANTAGED. VOLUME I.
Leonard F. Slobbodin, Mary I. Collins, Jerry L. Crayton, Jack M. Feldman, and James J. Jaccard.
1972, 222p
Grant SRS-15-55175

Descriptors: *Culture(Social sciences), *Programmed instruction, *Social psychology, Differences, Background, Ethnic groups, United States, Negroes, Caucasians, Attitudes, Behavior, Handbooks.
Identifiers: *Culture assimilators, *Social interaction, *Textbooks, Crossculture(Sociology), Understanding.

The culture assimilator is designed to increase the effectiveness of social interaction when people from different cultures and backgrounds are involved. This particular assimilator is intended to teach about misunderstandings that occur because of cultural differences among different groups of Americans, in particular, blacks and whites. However, when the Assimilator states that blacks are more likely to do something than whites, it does not necessarily mean that 100% of the blacks or 100% of the whites will behave in this manner. The approach is a written multiple choice situation explanation. The student chooses what appears to be the best answer to a situation question and the textbook confirms his choice or points out his error.

PB-235 513/9GA PC$7.00/MF$2.25
Oregon Univ., Eugene. Dept. of Physchology.
PSYCHOLOGICAL ASSESSMENT OF PATIENTS WITH BRAIN INJURY.
Final rept.,
Peter M. Lewinsohn. 31 May 73, 197p*
Grant SRS-15-55299

Descriptors: *Brain damage, *Rehabilitation, *Psychological tests, Patients, Neurology, Vocational guidance, Aphasia, Education, Questionnaires, Cerebellum.
Identifiers: *Neuropsychiatry, Vocational rehabilitation.

Contents:
- Neuropsychological test results for selected criterion groups;
- A follow-up study of persons referred for vocational rehabilitation who have suffered brain injury;
- Short-term memory--A comparison between frontal and nonfrontal right- and left-hemisphere brain-damaged patients;
- Study of patients with short-term memory deficits--A test of several hypotheses;
- An experimental study of information processing in brain injured populations;
- Effects of left and right cerebral lesions on the naming process;
- Training in neuropsychology.

PB-235 525/3GA PC$5.75/MF$2.25
San Diego State Coll. Foundation, Calif.
INTELLIGENCE TEST MODIFICATIONS ON HANDICAPPED AND NONHANDICAPPED CHILDREN.
Final rept. (supplement),
Jerome M. Sattler. 1 Nov 72, 128p
Grant SRS-15-55277

Descriptors: *Intelligence tests, *Children, Handicapped persons, Instructions, Recognition.

The report is a supplement to the final report on intelligence test modifications on handicapped and nonhandicapped children. It contains the directions for the modified tests, the modified stimuli, and the record booklets that were used in the research project. Statistical analyses of the materials contained in the supplement are presented in the major part of the final report.

SC-TM-72-0617 PC$4.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
EFFECTS OF FLICKER ON PERFORMANCE AS A FUNCTION OF TASK-LOADING.
H. E. Guttmann, R. G. Easterling, and R. G. Webster. Nov 72, 28p

Descriptors: (*Man, *Performance), Aircraft, Behavior, Orientation, Variations, Visible radiation.

For abstract, see NSA 30 08, number 23386.

5K. Sociology

AD-786 158/6GA Reprint
Armed Forces Inst of Pathology Washington D C
BIAS AND QUALITY CONTROL IN FORENSIC SCIENCE: A CAUSE FOR CONCERN,
M. A. Thomson. 27 Dec 73, 15p
Revision of report dated 23 Aug 73.
Availability: Pub. in Jnl. of Forensic Sciences, v19 n3 p504-517 1974.

Descriptors: *Criminology, Law enforcement, Quality control, Reviews.
Identifiers: *Forensic science, *Criminal justice.

This paper examined the growth of the role of forensic science within the criminal justice system and how the system has become dependent on it. It also noted that other mainstays of law enforcement have been limited by overreliance upon them by police. The constitutional and statutory provisions for expert assistance in the United States were examined and compared with foreign provisions, and proposed reforms in the area of expert assistance noted. The treatise examined the current forensic science function within the criminal justice system and noted inherent problems of access, availability, bias, and alignment. It demonstrated the need for a quality control and accreditation program for forensic science facilities. In survey, it has concluded with a proposal to improve the service that forensic facilities provide to the criminal justice system and to relieve some of the inequities currently in the system.

COM-71-80004-62/GA PC-GPO/MF$2.25-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF THE POPULATION: 1970. DISTRIBUTION OF FOREIGN STOCK POPULATION: 1970.
Supplementary rept.
May 74, 17p CENSUS-70-PC(SI)-62
Paper copy available from GPO $0.35 as C3.223/12:970/62.

Descriptors: *Census, *Population census, Tables(Data), United States.
Identifiers: Foreign stock population.

The report presents data from the 1970 census on the numbers and geographic distribution of foreign stock in the United States. The tables show counts of the total foreign stock population and of the foreign born and native of foreign or mixed parentage, separately, for the Nation as a whole, and for regions, divisions, each of the 50 states and the District of Columbia, standard metropolitan statistical areas (SMSA's) with 250,000 or more persons, and places of 100,000 or more persons.

COM-71-80004-63/GA PC-GPO/MF$2.25-NTIS
Bureau of the Census, Washington, D.C.
CENSUS OF POPULATION: 1970. PER CAPITA INCOME, MEDIAN FAMILY MONEY INCOME, AND LOW INCOME STATUS IN 1969 FOR STATES, STANDARD METROPOLITAN STATISTICAL AREAS, AND COUNTIES: 1970.
Supplementary rept.
Jun 74, 83p CENSUS-70-PC(SI)-63
Paper copy available from GPO $1.05 as C3.223/12:970/63.

Descriptors: *Census, *Population census, *Median income, *Low income, *Per capita income, Tables (Data), United States, Counties, Standard metropolitan statistical areas, Poverty level.

The report presents data on per capita and median family income in 1969 for States, standard metropolitan statistical areas (SMSA's), and counties ranked in decending order, from the highest to the lowest income levels. Additional information on the proportion of families with incomes less than the low income level is also shown for these areas. Similar data have previously been published in Series PC(SI)-48.

COM-72-70003/GA PC-CENSUS
CONGRESSIONAL DISTRICT DATA. DISTRICTS OF THE 93D CONGRESS.
Interim repts.
1971-72,46 issuesCDD-93X-1--CCD-93X-46
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $10.00/set.

The reports present 1970 population and housing data and recent election statistics for districts of the 93d Congress, which began its 2-year term in Jan 73. The population figures show the number of persons in the state and each congressional district by race (white, Negro, and other), sex, residence, and broad age groups; population per square mile; and percent change in population, 1960-1970. The housing data show total number of housing units, number and value or monthly rent of owner- and renter-occupied units, units lacking complete plumbing, and units with more than one person per room. The elections data show vote cast in Congressional and Presidential elections, 1964-1970, by major party. Explanatory text and maps showing congressional district boundaries, counties, and selected cities are also included. For individual state reports, order by COM-number listed below:

CDD-93X-27. New Jersey. Jul 72, 11p, COM-72-70003-27, PC-CENSUS-$0.25
CDD-93X-33. Oklahoma. Jun 72, 9p, COM-72-70003-33, PC-CENSUS-$0.25
CDD-93X-42R. Virginia (Revised). Jun 72, 9p, COM-72-70003-42R, PC-CENSUS-$0.25

COM-74-50929/0GA PC-GPO/MF$2.25-NTIS
Bureau of Domestic Commerce, Washington, D.C.
FEDERAL GOVERNMENT SOURCES ON CRIMES AGAINST BUSINESS,
Norris A. Lynch. Sep 74, 15p
Paper copy available from GPO $0.30.

Descriptors: *Crimes, *Industrial relations, *Information systems, Documents, Bad checks, Organizations, Government services.
Identifiers: Vandalism, Robberies, Burglaries, Shoplifting, Credit card fraud, Arson, Employee theft, Crimes against business.

The rapid rise of crime against business brings the need for a composite of material useful for assessing its impact. The main purpose of the study is to bring together in a concise and convenient package such of material published by the Government dealing with burglary, robbery, vandalism, shoplifting, employee theft, bad checks, credit card fraud, and arson.

COM-74-70001-92/GA PC-GPO
Bureau of the Census, Washington, D.C.

CURRENT POPULATION REPORTS. CONSUMER INCOME. ANNUAL MEAN INCOME, LIFETIME INCOME, AND EDUCATIONAL ATTAINMENT OF MEN IN THE UNITED STATES, FOR SELECTED YEARS, 1956 TO 1972.
Mar 74, 112p P-60/92
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $2.10/copy.

Descriptors: *Census, *Population census, *Consumer income, Tables(Data), Education.

The report provides statistics for the United States on educational attainment and income for selected years from 1956 to 1972 assembled from information collected in the Current Population Survey. The educational attainment estimates in the report are limited to men with income and accordingly differ slightly from general education statistics relating to all men which are presented in an appendix table. Included in the report are annual mean income and estimates of expected lifetime income in current (1972) dollars, by educational attainment and age group, for all males and for male year-round full-time workers.

COM-74-70001-93/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. CONSUMER INCOME. MONEY INCOME IN 1973 OF FAMILIES AND PERSONS IN THE UNITED STATES (ADVANCE REPORT).
Jul 74, 12p P-60/93
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.30/copy.

Descriptors: *Census, *Population reports, *Consumer income, Tables(Data), Family characteristics, Socioeconomic status.

The report presents statistics on money income in 1973 of families and persons in the United States, based on the March 1974 Current Population Survey. Some figures are also shown for 1972 and earlier years. Data are provided on selected characteristics of families and families with heads working year round full time, including median income, standard error, and race of head, and of persons 14 years old and over and persons working year round full time, including median income, standard error, and sex. Other tables provide data, cross-classified by total money income, on: Families and unrelated individuals by race, farm-nonfarm residence, age of head, and age of individual; persons 14 years old and over by race, farm-nonfarm residence, and sex.; and households by race of head, farm-nonfarm residence, age, sex, and education. Summary data for selected years are shown for families by total money income, money in constant dollars, and race of head.

COM-74-70001-95/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. CONSUMER INCOME. SUPPLEMENTARY REPORT ON THE LOW-INCOME POPULATION: 1966 TO 1972.
Jul 74, 65p P-60/95
Paper copy available from GPO $30.50/year including series P-20, P-23, P25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $1.30/copy.

Descriptors: *Census, *Population census, *Consumer income, *Low income level, Tables(Data), Socioeconomic status.

The report presents detailed social and economic statistics for the population of the United States below the low-income level in 1966 to 1972, based on the March 1967 to 1973 Current Population Surveys. The data were extracted from a series of tabulations prepared for and previously distributed by the Office of Economic Opportunity. Data are presented on the low-income status of persons cross-classified by age, family status, race, sex, work experience, occupation, industry, major activity during survey week, income of a specified type, and metropolitan-nonmetropolitan residence.

COM-74-70002-1507/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. SPECIAL CENSUSES. SUMMARY OF SPECIAL CENSUSES CONDUCTED BY THE BUREAU OF THE CENSUS BETWEEN JANUARY 1, 1973 AND JUNE 30, 1973.
Summary rept.
Dec 73, 7p P-28/1507
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Tables(Data), Population characteristics.

The report summarizes all special censuses conducted by the Bureau of the Census between January 1 and June 30, 1973. A total of 92 special censuses were conducted in this period. Population data are shown for each census for: Area, county, date of special census, total population, comparative 1970 Census figures, increase by number and percent, and population by race and sex. The report also contains the population of areas annexed to municipalities during the period covered.

COM-74-70002-1508/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. SPECIAL CENSUSES. SUMMARY OF SPECIAL CENSUSES CONDUCTED BY THE BUREAU OF THE CENSUS BETWEEN JULY 1, 1973 AND DECEMBER 31, 1973.
Summary rept.
Mar 74, 8p P-28/1508
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, Tables(Data), Population characteristics.

The report summarized all special censuses conducted by the Bureau of the Census between July 1, 1973 and December 31, 1973. Special censuses are taken at the request and expense of the local areas. Two tables in the report present data by sex, race, and increase of the population of areas in which special censuses have been taken and population of areas annexed to municipalities within these areas.

COM-74-70004-258/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. HOUSEHOLD AND FAMILY CHARACTERISTICS, MARCH 1973.
Dec 73, 103p P-20/258
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65, $1.80/copy.

Descriptors: *Census, *Population census, *Family characteristics, *Household characteristics, Tables(Data).

The report presents detailed statistics for the United States, for March 1973, on characteristics of families, subfamilies, husband-wife families, families with female head, unrelated individuals, and households. The data includes information on the number and size of families and households by type, age of members, presence and age of children, residence (farm nonfarm, metropolitan-nonmetropolitan, and selected standard metropolitan statistical areas), occupation on family heads, marital status of household and family heads, and married couples by age of husbands and wives. The text highlights information on family heads by age, race, and family type; characteristics of households headed by persons 65 years old and over; recent increases in primary individuals; and households by type and size for the United States and regions.

COM-74-70004-259/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. PERSONS OF SPANISH ORIGIN IN THE UNITED STATES: MARCH 1973 (ADVANCE REPORT).
Jan 74, 4p P-20/259
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65, $0.25/copy.

Descriptors: *Census, *Population census, Tables(Data), Spanish language, Education, Socioeconomic status.

The report presents March 1973 Current Population Survey totals for persons of Mexican, Puerto Rican, Cuban, Central or South American, and other Spanish origin. The report disucsses certain changes in the classification of persons of Spanish origin, particularly Mexican origin, that were made for the first time in the March 1973 Current Population Survey. A comparison between 1973 Current Population Survey results and the 1970 census are shown for persons of Spanish origin by type.

COM-74-70004-261/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. SCHOOL ENROLLMENT IN THE UNITED STATES: OCTOBER 1973 (ADVANCE REPORT).
Mar 74, 8p P-20/261
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65, $0.25/copy.

Descriptors: *Census, *Population census, *School enrollment, Tables(Data).

The report provides advance data on school enrollment of the population 3 to 34 years old in the United States based on the October 1973 Current Population Survey. Data for school enrollment of the population 3 to 34 years old are shown by level of school, age, and race for October 1973 and by age, race, sex, and selected educational characteristics for October 1973. College enrollment of the population 14 to 34 years old is shown by race and sex for October 1964 to October 1973 and by type of college and year of enrollment for October 1973.

COM-74-70004-262/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. MOBILITY OF THE POPULATION OF THE UNITED STATES: MARCH 1970 TO MARCH 1973.
Kristin A.Hansen, and Larry H. Long. Mar 74, 67p P-20/262
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $1.20/copy.

Descriptors: *Census, *Population census, Mobility, Tables(Data).

The report presents data on population mobility in the United States. The text discusses selected aspects of mobility including regional patterns and migration differentials. Related reports are listed and definitions and explanations provided. A discussion of the source and reliability of the estimates is supplemented by eight text tables showing standard errors of estimated number or percentages of total persons, movers, and nonmovers by race and various demographic characteristics. Specific information is found in 28 detailed tables showing March 1970 to March 1973 data on mobility status, movers and nonmovers to and from standard metropolitan statistical areas (SMSA's) and

within and between centeral cities and the balance of the SMSA for various age and sex groups by selected characteristics.

COM-74-70004-264/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. PERSONS OF SPANISH ORIGIN IN THE UNTIED STATES: MARCH 1973.
May 74, 31p P-20/264
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.50/copy.

Descriptors: *Census, *Population census, Spanish language, Tables(Data), Socioeconomic status.

The report presents demographic, social, and economic data for persons of Spanish origin in the United States. These data were collected in the March 1973 supplement to the monthly Current Population Survey. Persons of Spanish origin are subdivided into the following categories: Mexican origin, Puerto Rican origin, Cuban origin, Centeral and South American origin, and other Spanish origin. Some of the characteristics that are described in the report are: Age, sex, residence, years of school completed, income, employemnt, occupation, marital status, and family characteristics.

COM-74-70004-266/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. HOUSEHOLDS AND FAMILIES, BY TYPE: MARCH 1974 (ADVANCE REPORT).
Jul 74, 7p P-20/266
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Family characteristics, *Household characteristics, Tables(Data).

The report provides advance data from the March 1974 sample survey on households and families, by type, in the Untied States. The tables present data for various years from 1940 to 1974 on: Average population per household and family, by age; selected characteristics of household heads, by age and sex; persons under 18 years old, by presence of parents and whether living with mother only, by marital status of mother; and family units by type and race.

COM-74-70004-268/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION CHARACTERISTICS. NURSERY SCHOOL AND KINDERGARTEN ENROLLMENT: OCTOBER 1973.
Aug 74, 21p P-20/268
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.45/copy.

Descriptors: *Census, *Population census, *School enrollment, Tables(Data), Children.

The report presents information on children enrolled in nursery school and kindergarten in the Untied States, based on the October 1973 Current Population Survey. Detailed tables provide data on enrollment of children 3 to 5 years old, cross-classified by age; race; type and control of school program; full-day and part-day attendance status; type and region of residence; family income; and occupation and years of school completed of household head. Included are data on 6-year-old children by selected characteristics, along with comparative data for the period 1964 to 1973.

COM-74-70006-511/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF THE UNITED STATES, BY AGE, SEX, AND RACE: APRIL 1, 1970 TO JULY 1, 1973 (ADVANCE REPORT).
Jan 74, 8p P-25/511
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data).

The report presents estimates of the United States population by age, sex, and race for April 1, 1970, July 1, 1970, July 1, 1971, and July 1, 1972, and July 1, 1973. Data are shown for the total population including Armed Forces overseas by annual age groups up to 44 years, then by 5-year age groups; and for the total resident population and the civilian resident population by 5-year age groups from 15 to 64 years. Data are also listed according to other selected age groups of particular interest, and median ages by sex and race are given.

COM-74-70006-515/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE NUMBER OF HOUSEHOLDS BY STATE, JULY 1, 1973 AND 1972.
Annual rept.
Mar 74, 8p P-25/515
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data), Household characteristics.

The report presents figures on total households and husband-wife households for July 1, 1972, with provisional figures for July 1, 1973. The 1973 figures are designated provisional since they are based on 1973 provisional estimates of the population for States. Data are shown for the United States, regions, divisions, and States. The appendix tables show: Distribution of States by percent deviation of 1970 estimate of households from 1970 census number of households; and distribution of households by region, in the estimates and in the Current Population Survey for 1972 and 1973.

COM-74-70006-517/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF COUNTIES, JULY 1, 1971 AND 1972.
Annual rept.
May 74, 77p P-25/517
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $1.15/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data), United States, Alaska, Louisiana.

The report presents population estimates for July 1, 1971 and provisional estimates for July 1, 1972 for all counties in the United States, by State, for Louisiana parishes, and for census divisions in Alaska. These estimates were developed jointly by designated State agencies and the Bureau of the Census under the Federal-State Cooperative Program for Population Estimates. The report also provides data from the April 1, 1970 census and number and percent of change from 1970 to 1972.

COM-74-70006-518/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF STATES, BY AGE, JULY 1, 1973.
Jun 74, 4p P-25/518
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data).

The report presents provisional estimates of the resident population of States, by broad age groups for July 1, 1973 and the resident population of States, by age, from the April 1, 1970 census. The data are shown by regions, divisions, and States. The estimates are consistent with the estimates of the total population of States given in Current Population Reports, Series P-25, No. 508 and estimates of the population of the United States by age published in report No. 519.

COM-74-70006-519/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF THE UNITED STATES, BY AGE, SEX AND RACE: APRIL 1960 TO JULY 1, 1973.
Annual rept.
Apr 74, 83p P-25/519
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $1.55/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data).

The report presents estimates of the population of the United States by sex, race, and single years of age for July 1, 1960 to 1973 and for April 1, 1960 and 1970, the dates of the two most recent censuses of population. Detailed tables provide estimates of the total, resident, and civilian population, as well as the components of population change. The text tables show: Age structure of the population; annual population and percent change in selected age groups; median age of the population by race and sex; age structure of the population by race; and sex ratio of the population in selected age groups. The charts show: Population change in selected age groups and distribution of the total population and of the white and Negro population, by age and sex. The appendix gives estimates of the total population including Armed Forces overseas and of the resident population, adjusted for net census undercount, by age, sex, and race.

COM-74-70006-520/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF STATES WITH COMPONENTS OF CHANGE, 1970 TO 1973.
Annual rept.
Jul 74, 29p P-25/520
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.75/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data), Population growth.

The report contains revised estimates of the population of States for July 1, 1970 through 1972 and provisional population estimates for July 1, 1973, together with provisional components of population change for the period April 1, 1970 to July 1, 1973. Data are summarized for both census regions and divisions and for standard Federal regions. Detailed tables provide data on: Provisional estimates of the resident and civilian population of States and of standard Federal regions for July 1, 1973 with components of population change since

April 1, 1970; annual estimates of the population of States and of standard Federal regions from 1970 to 1973; and average annual rates of population change for States by component for selected years.

COM-74-70006-521/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. POPULATION ESTIMATES AND PROJECTIONS. ESTIMATES OF THE POPULATION OF THE UNITED STATES AND COMPONENTS OF CHANGE: 1973 (WITH ANNUAL DATA FROM 1930).
Annual rept.
May 74, 23p P-25/521
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28, (summaries only), P-60 and P-65. $0.45/copy.

Descriptors: *Census, *Population census, *Population estimates, Tables(Data), Population growth.

The report provides estimates of the population of the United States for each July 1 from 1900 to 1973 and for each month from January 1, 1950 to January 1, 1974; estimates of the components of change for the total population for each calendar year and fiscal year from 1940 to 1973; and estimates of the components of population change, by race, for each calendar year and fiscal year from 1960 to 1973. The estimates of the components of population change are shown by; Population at the beginning of period; net change during period (number and percent); components of change during period (births, deaths, net civilian immigration, other); and rate per 1,000 midyear population (net change, natural increase, births, deaths, and net civilian immigration). The estimates of the population are shown by total population including Armed Forces overseas, resident population, and civilian population for the United States for April 1, 1940 to April 1, 1970, and for conterminous United States (excluding Alaska and Hawaii), for July 1, 1900 to 1939.

COM-74-70079-64/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF KANSAS COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Apr 74, 8p P-26/64
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Kansas, Tables(Data).

The report presents population estimates for Kansas counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-65/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF RHODE ISLAND COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Apr 74, 5p P-26/65
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Rhode Island, Tables(Data).

The report presents population estimates for Rhode Island counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-66/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF WASHINGTON COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
May 74, 7p P-26/66
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Washington(State), Tables(Data).

The report presents population estimates for Washington counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-67/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF NEVADA COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
May 74, 5p P-26/67
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Nevada, Tables(Data).

The report presents population estimates for Nevada counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-68/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF NORTH CAROLINA COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jun 74, 8p P-26/68
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *North Carolina, Tables(Data).

The report presents population estimates for North Carolina counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-69/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF MICHIGAN COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jun 74, 8p P-26/69
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Michigan, Tables(Data).

The report presents population estimates for Michigan counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-70/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF ARKANSAS COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jun 74, 8p P-26/70
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Arkansas, Tables(Data).

The report presents population estimates for Arkansas counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-71/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF SOUTH CAROLINA COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jun 74, 7p P-26/71
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *South Carolina, Tables(Data).

The report presents population estimates for South Carolina counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-72/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF IOWA COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jul 74, 8p P-26/72
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Iowa, Tables(Data).

The report presents population estimates for Iowa counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-73/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF WYOMING COUNTIES: JULY 1, 1972 AND 1973.
Jul 74, 5p P-26/73
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Wyoming, Tables(Data).

The report presents population estimates for Wyoming counties prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-74/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF OREGON COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jul 74, 7p P-26/74
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Oregon, Tables(Data).

The report presents population estimates for Oregon counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-75/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF INDIANA COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jul 74, 8p P-26/75
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Indiana, Tables(Data).

The report presents population estimates for Indiana counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-76/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF ALABAMA COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jul 74, 8p P-26/76
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Alabama, Tables(Data).

The report presents population estimates for Alabama counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-77/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF MISSOURI COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Jul 74, 8p P-26/77
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Missouri, Tables(Data).

The report presents population estimates for Missouri counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-78/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF ILLINOIS COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Aug 74, 8p P-26/78
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Illinois, Tables(Data).

The report presents population estimates for Illinois counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-79/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF CONNECTICUT COUNTIES: JULY 1, 1972 AND 1973,
Aug 74, 8p P-26/79
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Connecticut, Tables(Data).

The report presents population estimates for Connecticut counties prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70079-80/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF OHIO COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Aug 74, 8p P-26/80
Paper copy available from GPO $30.50/year including Series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *Ohio, Tables(Data).

The report presents population estimates for Ohio counties and metropolitan areas prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70092-81/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF WISCONSIN COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Sep 74, 8p P-26/81
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 andP-65. $0.25/copy

Descriptors: *Census, *Population census, *Population estimates, *Wisconsin, Tables(Data).

The report presents population estimates for Wisconsin Counties and metropolitan areas, prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

COM-74-70092-82/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. FEDERAL-STATE COOPERATIVE PROGRAM FOR POPULATION ESTIMATES. ESTIMATES OF THE POPULATION OF NEW JERSEY COUNTIES AND METROPOLITAN AREAS: JULY 1, 1972 AND 1973.
Sep 74, 8p P-26/82
Paper copy available from GPO $30.50/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65. $0.25/copy.

Descriptors: *Census, *Population census, *Population estimates, *New Jersey, Tables(Data).

The report presents population estimates for New Jersey counties and metropolitan areas, prepared under the auspices of the Federal-State Cooperative Program for Local Population Estimates. The objective of the program is the development and publication of State-prepared estimates of the population of counties using uniform procedures largely standarized for data input and methodology. The estimates for counties are consistent with independent State population totals regularly prepared by the Bureau of the Census and published in the P-25 series of reports.

PB-235 210/2GA PC$3.75/MF$2.25
Illinois Univ., Urbana. Dept. of Psychology.
LINEAR VS BRANCHING STRUCTURES IN THE PRESENTATION OF ACCULTURATIVE MATERIALS.
Technical rept.,
Roy S. Malpass, and J. R. Salancik. Dec 72, 39p TR-18
Grant SRS-15-55175
Report on Illinois Studies of the Economically Disadvantaged.

Descriptors: *Disadvantaged minorities, *Interpersonal relations, Attitudes, Social communication, Testing, Human behavior, Personnel management, Decision making, Group dynamics.

The paper is a technical study examining the optimal format for assimilators. It contrasts two kinds of assimilators and finds that one is most suitable for difficult items and the other for easy items. The culture assimilator is a training procedure designed to explain to members of one culture how members of another culture view the world. It is hoped that such training will improve the chances of an economically disadvantaged employee to work with a boss from the mainstream.

PB-235 211/0GA PC$3.75/MF$2.25
Illinois Univ., Urbana. Dept. of Psychology.
VALUE PREFERENCES ARE MORE STRONGLY ASSOCIATED WITH SOCIAL CLASS THAN WITH SEX OR RACE.
Technical rept.,
Roy S. Malpass, and John D. Symonds. Nov 72, 33p TR-17
Grant SRS-15-55175
Report on Illinois Studies of the Economically Disadvantaged.

Descriptors: *Disadvantaged minorities, *Values, *Motivation, Employment, Incentives(Psychology), Human behavior, Cultural deprivation, Negroes, Males, Females, Social communication, Questionnaires, Surveys.

The study explores differences in the perception of values in samples of black and white males and females. Economic disadvantages are associated with and presumably create characteristic ways of perceiving and thinking about the social environment. These ways of perceiving and thinking are in sharp contrast to the ways of perceiving and thinking which characterize the middle class and other non-disadvantaged groups. Such differences create barriers in communication between a disadvantaged employee and his supervisor, his fellow employees and his subordinates.

PB-235 213/6GA PC$4.25/MF$2.25
National Urban League, Inc., Washington, D.C.
PROJECT STAR COOKBOOK.
1974, 65p
Grant SRS-15-55061
Sponsored in part by Family Service Association of America, New York, and National Association for Retarded Children, New York.

Descriptors: *Mental deficiencies, *Poverty, *Rehabilitation, Project planning, Social welfare, Community needs, Socially disadvantaged minorities, Ethnic groups.
Identifiers: *Mentally retarded persons.

Project STAR (Serving To Advance Rehabilitation) was a three year, tri-agency pilot plan designed to aid the families of diagnosed, adolescent mental retardates in poor and minority communities and to encourage and enable them to become involved in the operation of agencies that would help them. During the life of the project, STAR served roughly 600 families in five cities which were composed of a variety of ethnic groups.

PB-235 226/8GA PC$4.25/MF$2.25
Florida Univ., Gainesville. Regional Rehabilitation Research Inst.
REDUCING ECONOMIC DEPENDENCY AMONG WELFARE RECIPIENTS. A REVIEW OF VOCATIONAL REHABILITATION AND MANPOWER TRAINING RESEARCH,
Laurie S. Hamilton, and John E. Muthard. Aug 73, 71p Mono-6
Grant SRS-15-55142

Descriptors: *Welfare programs, *Vocational guidance, *Rehabilitation, Social welfare, Public assistance, Manpower programs, Reviews.

The research and evaluation literature of several federal Manpower training programs and the Federal-State Vocational Rehabilitation program was reviewed to determine effectiveness in reducing economic dependency among welfare recipients. Emphasis was on the Vocational Rehabilitation program, with findings from Manpower programs used for comparison. Significant findings are summarized and implications for Manpower Administration and Social and Rehabilitation Service policy, practice and research are drawn.

PB-235 229/2GA PC$5.25/MF$2.25
Illinois Univ., Urbana. Dept. of Psychology.
RACE, ECONOMIC CLASS, AND JOB-SEEKING BEHAVIOR: AN EXPLORATORY STUDY.
Technical rept.,
Jack Feldman. May 72, 106p TR-15
Grant SRS-15-55175
See also PB-215 251. Report on Illinois Studies of the Economically Disadvantaged.

Descriptors: *Disadvantaged minorities, *Job perception, Employment, Attitudes, Incentives(Psychology), Ethnic groups, Negroes, Personnel development, Human behavior, Surveys.

The study sought to test several hypotheses about race and social-class differences in beliefs, values, and social norms related to jobs and job-seeking behavior. It was expected that, because of discrimination and lack of work-relevant skills, the black samples (especially the black hardcore unemployed) would see work and the job-seeking environment as essentially unpredictable situations, where effort is not related to reward. The white working class was expected to see work and job seeking as highly predictable environments, where effort is strongly related to reward. Finally, it was also predicted that the evaluation of work, and job-seeking behavioral intentions, would be best predicted by the instrumentality model for white working class, and least well for the black hardcore unemployed, with the black working class and white hardcore intermediate.

PB-235 230/0GA PC$4.25/MF$2.25
Illinois Univ., Urbana. Dept. of Psychology.
SUPERVISOR TRAINING PROGRAMS ON MINORITY EMPLOYMENT: SUGGESTED CONCEPTS AND PROCEDURES.
Technical rept.,
David J. Cherrington. May 72, 58p TR-16
Grant SRS-15-55175
Report on Illinois Studies of the Economically Disadvantaged.

Descriptors: *Disadvantaged minorities, *Personnel development, Interpersonal relations, Roles(Behavior), Attitudes, Negroes, Social communication, Incentives(Psychology), Motivation, Cultural deprivation, Employment.

A slide-tape presentation and a readers theater script have been developed as training tools for teaching cultural differences. The objective of the slide-tape presentation was to present a systematic listing of eight of the most salient cultural differences between the white middle-class culture and the black getto culture. A theoretical or historical explanation is given for each difference, and some of the possible effects of these cultural differences in industry, such as misunderstanding and conflict, are described. In the readers theater script these cultural differences are portrayed in a real life setting showing two quite opposite interpretations of a black employee's behavior.

PB-235 232/6GA PC$7.50/MF$2.25
Illinois Univ., Urbana. Dept. of Psychology.
BLACK AND WHITE HARDCORE AND MIDDLE CLASS SUBJECTIVE CULTURES: A CROSS-VALIDATION.
Technical rept.,
Harry C. Triandis, David Weldon, and Jack Feldman. Apr 72, 228p TR-14
Grant SRS-15-55175

Report on Illinois Studies of the Economically Disadvantaged.

Descriptors: *Disadvantaged minorities, *Values, Human behavior, Employment, Family relations, Males, Females, Negroes, Cultural deprivation, Social communication, Attitudes, Parent child relations.

The study is a summary of the descriptive work which specifies how the disadvantaged differ from the rest of the population. It is based on a sample of 240 individuals who differ in race, employment status, sex and age, but it also reviews previous work. It gives details of how the hardcore unemployed view their social environment and contrasts it with similar information obtained from other samples. At the end of this report there is a summary which gives a quick overview of the main findings.

PB-235 379/5GA PC$4.75/MF$2.25
Durham Community House, N.C.
A MODEL OF GROUP THERAPY FOR USE WITH LOW-INCOME ADOLESCENTS.
Paul B. Fiddleman. 1967, 78p SRS-RD-2962

Descriptors: *Adolescence, *Group therapy, Low income families, Females, Economically disadvantaged minorities, Group dynamics, Interpersonal relationships.

The model described developed out of an attempt to provide services to fit the needs of a group of low-income, disadvantaged adolescents, predominantly female and black. The girls were members of the Neighborhood Youth Corps, an OEO funded program to provide occupational and educational services to groups of school drop-outs between the ages of 16 and 21.

PB-235 519/6GA PC$4.75/MF$2.25
Philadelphia Dept. of Public Welfare, Pa.
AREA YOUTH WORK DEMONSTRATION PROJECT INVOLVING INDIGENOUS PERSONNEL.
Final rept. 1 Jul 70-30 Jun 73,
Joseph Wnukowski, and Earl Hollingshed. 1973, 83p
Grant SRS-12-55125
Prepared in cooperation with La Salle Coll., Philadelphia, Pa. Dept. of Sociology.

Descriptors: *Juvenile delinquency, *Disadvantaged minorities, *Rehabilitation, Social welfare, Central city, Crime reduction, Attitudes, Unemployment, Counseling, Pennsylvania.
Identifiers: *Youth programs, Demonstration projects, Philadelphia(Pennsylvania).

The Youth Conservation Services Area Youth Work Unit has conducted a three-year demonstration project exploring the utilization of indigenous personnel in service to hostile youth groups in the City of Philadelphia. The evaluation of the demonstration project was based on a research design which tested the hypothesis that indigenous workers, with appropriate professional supervision and training, could perform these services as effectively as regular, academically-trained and experienced workers. (Modified author abstract)

PB-235 520/4GA PC$3.75/MF$2.25
Albert Einstein Coll. of Medicine, Bronx, N.Y.
THE REHABMOBILE: A MOBILE REHABILITATION CLINIC.
Victor Cummings, and Bernard Kutner. Nov 72, 30p
Grant SRS-RD-3149-M

Descriptors: *Medical care, *Mobile equipment, *Central city, Rehabilitation, Ethnic groups, New York.
Identifiers: Demonstration projects.

The report describes the results of a method for delivering rehabilitation services to the physically handicapped residents of a large urban ghetto without adequate ambulatory care facilities. The 'REHABMOBILE' (a mobile rehabilitation clinic) served 123 patients, providing 888 services during 622 individual visits. Research indicates that the patient population served covered a wide age range, a large variety of diagnostic entities and disabilities ranging in severity from mild to moderate. The vehicle provided the services of a physician, physical therapist, occupational therapist, speech and hearing pathologist and a social worker operating on a four-day per week schedule. (Modified author abstract)

PB-235 521/2GA PC$3.75/MF$2.25
East Central State Coll., Ada, Okla.
DEVELOPMENT OF A MODEL INFORMATION AND DEMONSTRATION SITE FOR THE REMOVAL OF ARCHITECTURAL BARRIERS.
Final rept. 1 Jun 71-30 May 72,
Bill J. Tillman, and O. J. Collins. Sep 72, 31p
Grant SRS-12-55227

Descriptors: *Structural design, *Handicapped persons, *Barriers, Architecture, Buildings, Design improvements.
Identifiers: Demonstration projects, Physically handicapped persons.

A model demonstration site and information center for the removal of architectural barriers has been in operation on the campus of East Central State College in Ada, Oklahoma. To demonstrate the value of an information and demonstration site for the dissemination of information on removal of architectural barriers; to serve as a center for coordination of all efforts to remove architectural barriers supported by agencies such as the Society for Crippled Children and Adults, Handicapped and Rehabilitation Agencies; to provide consultant and technical assistance to colleges, schools, institutions, business, industry, and other public and private organizations; to create a barrier free center by the removal of existing architectural barriers; to provide documented guidelines for the removal of architectural barriers in several different types of buildings; to develop printed and audio visual materials; to hold seminars and workshops.

PB-235 578/2GA PC$4.25/MF$2.25
Kramer (Leo), Inc., Washington, D.C.
AN EVALUATION OF YOUTH PROGRAMS CONDUCTED BY THE NATIONAL CONFERENCE OF CHRISTIANS AND JEWS.
Jan 72, 52p

Descriptors: *Project planning, *Schools, *Police, *Students, Evaluation, Social communication, Drama, Community relations, Race relations, Virginia, Maryland, District of Columbia.
Identifiers: Fairfax County(Virginia), Alexandria(Virginia), Prince Georges County(Maryland).

The final evaluation of four youth programs conducted by the National Conference of Christians and Jews, National Capital Area, is intended to describe and analyze the progress made in these programs since the last full year evaluation. The report suggests directions that might be explored by NCCJ as it strives to build upon the experiences gained over the past three years. The programs are: Student leaders and administrators program; career exposure program; dig-it; police-youth relations program. Funded by the United States Department of Health, Education and Welfare, the programs are fundamentally designed to build bridges between the disadvantaged youths of the area and other elements of the broader community with which they will come into contact as they grow into adulthood.

PB-235 677/2GA PC$4.25/MF$2.25
Illinois Univ., Chicago. Coll. of Engineering.
POLICING INTER-COMMUNITY MASS TRANSIT SYSTEMS: PROPOSED LEGISLATION FOR CHICAGO WITH A CONSIDERATION OF OTHER CITIES.
Research rept. (Final),
P. S. Wallace, and R. M. Buren. Mar 74, 62p RR-7 UMTA-IL-11-0024-74-1
Prepared in cooperation with Illinois Univ., Chicago, Dept. of Criminal Justice.

Descriptors: *Crime reduction, *Transportation problems, *Mass transportation, Legislation, Recommendations, Illinois, Police, Urban transit systems, Municipalities, Reviews, Ohio, Canada.
Identifiers: *Chicago(Illinois), *Cleveland(Ohio), Toronto(Canada), Proposed legislation.

The purpose of the report is to present model legislation that will require inter-community mass transit systems to be responsible for the safety of their passengers while using transit facilities. An effort is made to show why this legislation is necessary and how it is a solution to the present problem of high crime and low passenger safety on selected mass transit systems. In metropolitan Chicago, Illinois, as a selected example, the recent history is given (1967-1972) of the rise in transit crime and the apparently police response. The effects of the present multi-community policing are stated and explained. Some brief concluding remarks are presented.

PB-235 819/0GA PC$4.75/MF$2.25
Maryland Univ., College Park. Water Resources Research Center.
AN INVESTIGATION OF FACTORS AFFECTING THE RECREATIONAL USE OF STATE PARKS.
Technical rept.,
Donald J. Volk, and Alan O'Neill. 1967, 87p TR-27 W74-12198, OWRR-A-008-MD(1)
Contract DI-14-01-0001-790

Descriptors: *Water resources, *Recreational facilities, *Parks, Distance, Sites, Demand(Economics), Attendance, Social aspects, Quality.
Identifiers: Water recreation.

The distance of a recreation facility from potential users does exert an important influence on the intensity of use which a facility receives. The exact nature of this influence varies somewhat depending on the nature of the recreation area, but is in all cases the dominant influence. Some information concerning the type and quality of the recreation area under consideration is necessary if these attendance-distance relationships are to be used for predictive purposes. Further studies with different types of recreation areas should help define more precisely differences in the attendance-distance relationship with differing kinds of recreation areas. Quality and uniqueness of the recreation area are important factors to consider when looking at the attendance-distance relationship. It is desirable to locate many types of recreation facilities where they will be accessible to large numbers of people.

PB-236 118/6GA PC$5.75/MF$2.25
Chicago Univ., Ill. Center for the Study of Welfare Policy.
FAMILY ASSISTANCE PLAN, H. R. 1, AND ALLIED SERVICES ACT (PROPOSED).
Special rept.,
Kathryn K.Schreiner. Sep 72, 139p Working Paper-A-5 SRS-10-56020-015
Grant SRS-10-56020

Descriptors: *Social welfare, *Financial assistance, *Income level, Family budgets, Poverty, Unemployment, Employment, Counseling, Children, Legislation, National government, Local government.

The project analyzes H. R. 1 bill as an adequate income program and attempts to determine how closely this type of welfare reform legislation approximates a proposed strategy of income equalization. It was found that the bill retained few

of the positive features of the administration's original family assistance plan and, in fact, made the cost of receiving benefits very high because of work registration and reporting requirements. The bill railed to provide for an adequate level of income, and it marked a setback for service integration goals, as responsibility for service delivery was split among the Department of Labor, the Department of Health, Education, and Welfare, and the individual states.

PB-236 138/4GA PC$3.75/MF$2.25
Alaska Div. of Vocational Rehabilitation, Anchorage.
SOUTH CENTRAL ALASKA PROJECT: THE EVALUATION TEAM AND THE HABILITATION HOUSES SUBPROJECTS. VOLUME II.
Final rept.,
Carroll M. Craft, Harold W. James, and Franklin E. Campbell. May 70, 47p SRS-RD-1661-002
Grant SRS-RD-1661-G

Descriptors: *Rehabilitation, *Natural disasters, Social welfare, Health benefits, Financial assistance, Earthquakes, Comprehensive planning, Rural areas, Alaska.
Identifiers: *Emergency services.

Demonstration services provided to approximately 1,600 clients in the aftermath of the Alaska earthquake in March 1964 included evaluation of client needs and establishment of halfway houses. The evaluation subproject processed slightly over 700 cases using a team approach, combining interviews and testing. The remainder were evaluated by a modified intake process. Two habilitation houses provided residency, counseling, and orientation to over 130 clients with an average stay of 97 days.

PB-236 139/2GA PC$9.25/MF$2.25
Michigan Univ., Ann Arbor. School of Social Work.
CLIENT CAREERS AND PUBLIC WELFARE STRUCTURES.
Final rept.,
Rosemary C. Sharri, John E. Tropman, Matthew Silberman, Edward J. Pawlak, and Kenneth Badal. Mar 70, 307p SRS-CP-0425

Descriptors: *Social welfare, *Children, Local government, Welfare programs, Placement, Decision making, Juvenile deliquency, Performance evaluation, Project management, Evaluation, Data processing, Mathematical models, Correctional services planning, Professional personnel.

The report covers activities during the second year of the research project entitled, 'Client Careers and Welfare Structures.' This project has four main objectives. The first objective is to study the organizational careers of cohorts of clients served by agencies within state departments of social services (and corrections where applicable) in five states, over a two- to three-year period of time. Analysis of goals, organizational structures, and processes of decision-making in local public welfare agencies was an additional objective. The third objective was to relate demographic and social indicator data about cities and counties to characteristics of local public welfare agencies and to client carrer patterns. Formulation of tentative guidelines for the development of information-processing systems in state departments of social services was the last objective.

PB-236 140/0GA PC$4.75/MF$2.25
Chicago Univ., Ill. Center for the Study of Welfare Policy.
ON THE FRINGE OF SERVICES: AN EXPLORATORY SURVEY OF MOBILE HOME DWELLERS.
Special rept.,
Stephen Spigel. Sep 72, 78p Working Paper-B-3 SRS-56020-005
Grant SRS-10-56020
Report on Social Service Delivery Project.

Descriptors: *Social welfare, *Migratory families, *Transients, Mobile homes, Trailer parks, Rural urban fringe, Socioeconomic conditions, Public opinion, Surveys, New York, Illinois.

The analysis, utilizing opinion research, examines patterns of social service usage among mobile home dwellers. The analysis considers socioeconomic characteristics, regionality, mobility, accessibility, community integration, and levels of well-being of mobile home dwellers to determine if these factors are related to use of social services. The focus is upon the needs articulated by the sampled population to determine if there is a linkage between socioeconomic needs and the use of services.

PB-236 141/8GA PC$7.50/MF$2.25
Chicago Univ., Ill. Center for the Study of Welfare Policy.
YOUTH AND THE PUBLIC SECTOR.
Special rept.,
Jeff C. Goldsmith. Sep 72, 238p Working Paper-B-1 SRS-10-56020-003
Grant SRS-10-56020
Report on Social Service Delivery Project.

Descriptors: *Social welfare, *Youths, Adolescence, Employment, Drugs, Attitudes, Behavior, Education, Government policies, Dependence, Culture(Social sciences).
Identifiers: *Youth services.

The report describes a project studying the status of youth in this society. It was found that the shortage of jobs prolongs the marginality of youth and increases the likelihood of some sort of dependency. Youth and their problems are ignored on the federal and local level, but youth have only slight dependence on parents or public assistance. They rely rather on an innovative (free) service system, communal sharing, and a marginal structure of both legal and illegal jobs. The report recommends demonstration projects and changes in both institutions and policies dealing with youth on the federal level.

PB-236 334/9GA PC$3.25/MF$2.25
North Carolina State Dept. of Social Services, Raleigh.
FORSYTH COUNTY YOUTH DEVELOPMENT PROJECT OF THE NORTH CAROLINA STATE DEPARTMENT OF SOCIAL SERVICES.
Final rept. 1 Jul 70-30 Jun 72,
Kathy Knecht, Ellen Shealy, and Nadine Roberts. Jun 72, 23p SRS-11-57107-001
Grant SRS-11-57107

Descriptors: *Youths, *Recreation, Disadvantaged minorities, Project planning, Operating costs, Community cooperation, North Carolina.
Identifiers: *Youth programs, Forsyth County(North Carolina).

The Forsyth County Youth Development Project was funded initially on July 1, 1970 and was designed to demonstrate the value of providing adolescent children from poor families an opportunity to participate in established community programs which are ordinarily limited to children from non-poor families. Social workers within this project were to assist these children in the achievement of individual development while the activities provided them with a form of part-time supervised care.

PB-236 335/6GA PC$5.75/MF$2.25
Baruch Coll., New York. Center for the Study of Urban Problems.
FAMILIES ON WELFARE IN NEW YORK CITY,
Lawrence Podell. 1968, 140p SRS-CP-01814

Descriptors: *Social welfare, *Family characteristics, Surveys, Statistical analysis, Unemployment, Ethnic groups, Education, Public opinion, Religions, New York.

Using a sample of families on the welfare rolls in April of 1966, a survey was conducted that summer in which mothers were interviewed. The survey was part of a research project dealing with the utilization of health services by welfare recipients. In the course of this inquiry, information was gathered about many topics which were relevant to current community discourse, policy-making, and program-planning about public welfare.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-785 655/2GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
CELLULAR LOCALIZATION OF CALCIUM-BINDING PROTEIN,
Robert L. Morrissey, Thomas J. Bucci, Richard N. Empson, and Edward G. Lufkin. 1973, 16p

Descriptors: *Calcium, *Proteins, *Cytochemistry, Cells(Biology), Chemical bonds, Vitamin D, Metabolism, Histology, Tissues(Biology), Biochemistry, Intestines.
Identifiers: Histochemistry.

The authors have provided histochemical evidence that calcium binding protein (CaBP) is localized in the paracellular and basal region of intestinal cells, thus strengthening the hypothesis that the primary calcium transporting mechanism is localized in this region. The unique previously unreported distribution of CaBP in renal tubular epithelium will require considerable rearrangement of current concepts of renal calcium metabolism. In fact, the apparent sepcialization of renal tubules may have implications of significance to renal physiology in general, since this degree of renal tubule heterogenicity has not been previously reported. Also, the demonstration of CaBP specific staining in pancreatic islet cells is a completely new finding, the significance and implications of which will only be known through future research.

AD-785 708/9GA Not available NTIS
Toronto Univ (Ontario) Dept of Zoology
COMPARISON OF TEMPLATE-PROPERTY CHANGES AFTER SALT EXTRACTION OF AVIAN ERYTHROCYTE AND LIVER CHROMATIN,
Verner L. Seligy, and Masakazu Miyagi. 20 Mar 74, 11p NRC-13942
Revision of report dated 21 Dec 73.
Availability: Pub. in European Jnl. of Biochemistry, v46 p259-269 1974.

Descriptors: *Liver, *Templates, *Erythrocytes, Chromosomes, Proteins, Nucleic acids, Histones, Biosynthesis.
Identifiers: *Chromatin.

The paper deals with two chromatin systems, both containing homologous DNA but with widely different template properties. Chromatin isolated from chicken liver and mature erythrocytes has been shown to differ significantly in both chemical and structural properties. From earlier studies differences in solubility, viscosity, nuclease activity and residual RNA content were not paramount for the determination of the divergent template activity properties of the two chromatin systems. Since differences in histone (I and V or f2c) as well as residual non-histone protein content occur, the authors have reexamined the template status of these two chromatin systems by studying, both quantitatively and qualitatively, their template properties before and after treatment with increasing concentrations of buffered salt.

AD-785 721/2GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)

HEMOGLOBIN G. /WAIMANALO: ALPHA64 ASP-ASN.
Technical rept.,
R. Quentin Blackwell, R. T. S. Jim, G. H. Tan, M. I. Weng, and C. S. Liu. 1973, 10p Rept no. NAMRU-2-TR-603
Availability: Pub. in Biochimica et Biophysica Acta, v322 p27-33 1973.

Descriptors: *Hemoglobin, *Anemias, Blood diseases, Philippines, Spectrophotometry.
Identifiers: Hypochromism, Hemoglobin G Waimanalo, Hereditary diseases, Asparagine.

Hemoglobin in G waimanalo was found in Hawaii, in 1971, in a male subject of Filipino ancestry being examined for mild microcytic hypochromic anemia. Analyses now indicate that this slow variant has its structural change at the alpha-64 or alpha E13 position where an asparaginyl residue replaces the aspartyl residue normally found at that location. Relative amounts of Hemoglobins Ao and G waimanalo in the hemolysate mixture from the initial subject's blood were found to be 81:19 by spectrophotometric measurement of fractions separated by column chromatography. Similar ratios were found in several relatives. (Author

AD-785 765/9GA Reprint
Vanderbilt Univ Nashville Tenn
PLASMA AND RED BLOOD CELL AMINO ACIDS OF EGYPTIAN CHILDREN SUFFERING FROM PORTEIN-CALORIE MALNUTRITION,
Mary M. Mikhail, Vinayak N. Patwardhan, and Carol I. Waslien. Apr 73, 9p NAMRU-3-TR-6-74 Grant PHS-AM-08317
Availability: Pub. in American Jnl. of Clinical Nutrition, v26 p387-392 Apr 73.

Descriptors: *Malnutrition, *Amino acids, Blood plasma, Calorimeters, Egypt, Children, Proteins, Erythrocytes, Blood cells, Nutritional deficiency diseases, Therapy.
Identifiers: Calorific value, *Kwashiorkor.

Alterations in the plasma or serum amino acid patterns of patients with protein-calorie malnutrition (PCM) have been described in many countries. Most investigators report a decrease in essential amino acid concentrations particularly for the branched-chain amino acids, valine, leucine, and isoleucine, but little or no change in nonessential amino acid levels. As a result, characteristically high ratios of nonessential to essential amino acids are found in the plasma of these children. Elevations in the ratios of red blood cell (RBC) to plasma amino acid concentrations have also been reported, but little notice has been given to concentrations of nonessential and essential amino acids or their ratios within the red blood cells. In this study, a comparison is made between changes in plasma and RBC nonessential and essential amino acids and their ratios with the aim of identifying which measurement is the best index to the clinical status of the patients during recovery from PCM.

AD-785 774/1GA Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
DETECTION OF SILICIC ACID CHROMATOGRAMS OF TREHALOSE AND OTHER SUGARS IN ARTHROPOD FLUIDS,
Taha T. M. Bassal. 1973, 5p Rept no. NAMRU-3-TR-9-74
Availability: Pub. in Jnl. of Medical Entomology, v10 n2 p228, 25 Apr 73.

Descriptors: *Arthropoda, *Body fluids, *Trehalose, *Sugars, Insects, Biochemistry.
Identifiers: *Hemolymph.

Trehalose is the principal sugar, besides glucose, in hemolymph of insects and other arthropods. Fructose, galactose, maltose and sucrose sugars have also been detected in certain insects. (Author)

AD-785 790/7GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
HAEMOGLOBIN CHAD, ALPHA23 GLU-LYS, IN A CHINESE FAMILY IN TAIWAN.
Technical rept.,
R. Q. Blackwell, M. I. Weng, and J. T. H. Huang. 12 Feb 73, 8p Rept no. NAMRU-2-TR-606
Availability: Pub. in Tropical and Geographical Medicine, v25 p393-396 1973.

Descriptors: *Hemoglobin, China, Taiwan, Electrophoresis, Negroes, Amino acids.
Identifiers: Hemoglobin Chad, Hemoglobin E Keelung.

Among approximately 160,000 Chinese subjects tested in Taiwan, 43 had hemoglobin variants in which the electrophoretic mobility has characteristic of Hemoglobins E, C, and A2. Variants from 32 of those subjects have been analyzed and 31 shown to be Hemoglobin E, beta 26 glutamyl yields lysyl. From the remaining subject the variant, called Hemoglobin E Keelung, had the change alpha23 glutamyl yields lysyl which was reported previously by others in Hemoglobin Chad. Hemoglobin E Keelung from the Chinese subject is assumed to be identical with Hemoglobin Chad which was found in two Negro subjects. Relative amounts of Hemoglobins Ao and E Keelung found in the Chinese subject were 85.5/14.5. Approximately the same ratio was found by the other workers in the two Negro subjects. (Author)

AD-785 863/2GA PC$3.75/MF$2.25
Washington Univ Seattle Lab for Chemometrics
THREE DIMENSIONAL MOLECULAR STRUCTURE-BIOLOGICAL ACTIVITY CORRELATION BY PATTERN RECOGNITION.
Technical rept. no. 6, Apr-Aug 74,
D. S. Dierdorf, and B. R. Kowalski. Aug 74, 41p

Descriptors: *Molecular structure, *Pattern recognition, *Carcinogens, Three dimensional, Transformations, Biology, Biochemistry, Chemical reactions.

A molecular structure transform has been developed that allows the three-dimensional structure of molecules to be related to their biological activity. The transforms utilize principal component analysis to transform the three dimensional cartesian coordinates and any atomic information such as electronegativity for each atom in a molecule. A predetermined and constant number of features is extracted from each molecule which can be analyzed by the methods of pattern recognition in order to relate molecular structure to any molecular function; in this case, carcinogenicity. The transform is graphically demonstrated using a simple triatomic molecule and then applied to two divergent classes of carcinogenic molecules; dimethylaminoazobenzenes and polycyclic aromatic hydrocarbons. Structure-activity results are presented along with an exciting potential for drug design. (Author)

AD-786 052/1GA Reprint
Edgewood Arsenal Aberdeen Proving Ground Md
DETECTION AND ESTIMATION OF ISOPROPYL METHYLPHOSPHONOFLUORIDATE AND O-ETHYL S-DIISOPROPYLAMINOETHYL-METHYLPHOSPHONOTHIOATE IN SEA-WATER IN PARTS-PER-TRILLION LEVEL.
Special publication,
Harry O. Michel, Eric C. Gordon, and Joseph Epstein. 9 Aug 73, 8p Rept no. EC-SP-74003
Revision of report dated 5 Apr 73.
Availability: Pub. in Environmental Science and Technology, v7 n11 p1045-1049 Nov 73.

Descriptors: *VX agent, *GB agent, Cholinesterase inhibitors, Sea water, Enzymes, Chemical analysis.
Identifiers: *Enzymatic analysis, *Water analysis.

A procedure is described for the estimation of two very potent anticholinesterase chemicals, viz., isopropyl methylphosphonofluoridate (GB) and O-ethyl S-diisopropylaminoethylmethylphosphonothioate (VX) in seawater in concentrations at the parts-per-trillion level by an enzymatic technique. Kinetic constants for the reaction of other anticholinesterases with two sources of cholinesterase and for the reaction of the cholinesterases with several substrates are given. With these data, the reader can select conditions for the development of procedures for estimating very low concentrations of these anticholinesterases in water. (Author)

AD-786 067/9GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
HEMOGLOBIN J. MEERUT: ALPHA 120 ALA TO GLU.
Technical rept.,
R. Q. Blackwell, W. H. Boon, C. L. Wang, M. -I. Weng, and C. -S. Liu. 1 Aug 73, 9p Rept no. NAMRU-2-TR-602
Revision of report dated 1 August 73.
Availability: Pub. in Biochimica et Biophysica Acta, v351 p7-12 1974.

Descriptors: *Hemoglobin, Amino acids, Mutations, Genetics, Anemias, Blood diseases, Biochemistry, India.
Identifiers: Hemoglobin J Meerut.

A fast hemoglobin variant recently was found in two Indian sisters from Meerut, Uttar Pradesh. The variant, named Hb J. Meerut, now has been found to have the structural change, Ala to Glu, at position alpha 120 (alpha H3). Relative proportions of the two major hemoglobin components Ao and J in the two subjects were 76/24 and 75/25. Further studies are required to determine whether anemia seen in one of the subjects is due to the presence of the variant. (Author)

AD-786 243/6GA Reprint
Wayne State Univ Detroit Mich Dept of Chemistry
COMPARATIVE STUDIES ON ADRENAL IRON-SULFUR PROTEIN AND ITS SELENIUM DERIVATIVES BY ELECTRON NUCLEAR DOUBLE RESONANCE,
Michael Bowman, Larry Kevan, Kazuo Mukai, and Tokuji Kimura. 13 Jul 73, 9p AROD-9999.6-C Grants DA-ARO-D-31-124-71-G180, PHS-AM-12713
Availability: Pub. in Biochimica et Biophysica Acta, v328 p244-251 1973.

Descriptors: *Adrenal cortex hormones, Oxidoreductases, Iron compounds, Hyperfine structure, Spectrum analysis, Proteins, Organic sulfur compounds, Selenium compounds, Chemical bonds, Coupling(Interaction), Cysteine, Nuclear magnetic resonance, Electron paramagnetic resonance.
Identifiers: *Electron nuclear double resonance, Matrix isolation techniques, *Ferredoxins.

Reduced adrenal ferredoxin from beef adrenal glands has been studied by electron nuclear double resonance (ENDOR) spectroscopy in frozen 2H2O matrices near 20K. Five proton hyperfine couplings for observation at the g(parallel) position of the EPR spectrum have been found in native adrenal ferredoxin and in adrenal selena-ferredoxin in which 80Se has been substituted for the two labile sulfurs (S(*)). These couplings are attributed to five of the eight possible inequivalent beta-CH2 protons in four cysteinyl residues attached to the two irons. ENDOR indicates at least three proton coupling for observation at the g(perpendicular) position. The proton couplings are all smaller in the adrenal selena-ferredoxin compared to native adrenal ferredoxin which indicates a smaller unpaired spin density on the sulfur atoms of the cysteine residues attached to the irons in the adrenal selena-ferredoxin. This may be associated with increased covalency of the Fe-Se bond relative to Fe-S(*) bonds. (Author)

AD-786 284/0GA PC$5.25/MF$2.25
Army Materiel Command Texarkana Tex Intern Training Center
A SYSTEM OF COMPUTER AIDED DIAGNOSIS WITH BLOOD SERUM CHEMISTRY TESTS AND BAYESIAN STATISTICS.
Final rept.,
Joseph W. Caldwell, Jr. Mar 73, 103p* Rept no. USAMC-ITC-2-73-06

Descriptors: *Blood chemistry, Diagnosis(Medicine), Test methods, Laboratory procedures, Laboratory equipment, Computer programming, Automation, Bayes theorem, Statistical analysis.
Identifiers: *Computer aided diagnosis, *Medical computer applications.

A set of twelve blood serum chemistry tests which can be evaluated on modern automated laboratory equipment were used as the symptoms in a Bayesian approach to computer aided differential diagnosis. A set of computer programs was developed to perform the necessary calculations at a local hospital so that it is easy for the local operator to handle and produce an output suitable for placing in a patient's record. The results indicated that in over sixty percent of the cases studied, the correct diagnosis was in a diagnostic list of diseases, each having a probability of greater than five percent. The conclusions suggest that this analysis of blood chemistry results could best be used on routine admission screening of patients to provide the patient's doctor with several diseases for his consideration. (Modified author abstract)

COM-74-50868/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MUTAROTATION OF SUGARS IN SOLUTION. PART II.
Final rept.,
H. S. Isbell, and W. Pigman. 1969, 51p
Grant PHS-AM-04619
Pub. in Advances in Carbohyd. Chem., v24 p14-65 1969.

Descriptors: *Sugars, *Rearrangement reactions, Solutions, Catalysis, Chemical equilibrium, Thermodynamic properties, Molecular structure, Isotope effect.
Identifiers: Chemical reaction mechanisms.

The publication is part of a comprehensive review describing and interpreting the changes which occur with reducing sugars in aqueous solutions. It treats, in depth catalysis by acids and bases, isotope effects, equilibrium states, thermodynamic properties, and reaction mechanisms. A new reaction mechanism is proposed in which the sugar ring is opened momentarily, forming a pseudoacyclic intermediate, having a conformation resembling that of the parent sugar. This intermediate passes through characteristic transition states to the various tautomeric modifications of the sugar.

COM-74-50892/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MECHANISMS OF THE LIEBERMANN-BURCHARD AND ZAK COLOR REACTIONS FOR CHOLESTEROL.
Final rept.,
R. W. Burke, B. I. Diamoodstone, R. A. Velapoldi, and O. Menis. 1974, 8p
Pub. in Clinical Chemistry, v20 n7 p794-801 1974.

Descriptors: *Cholesterol, *Colorimetric analysis, *Sulfur dioxide, *Iron, Carbonium ions, Oxidation.
Identifiers: Chemical reaction mechanisms.

Correlation of SO2 and Fe(2+) measurements with new spectral data indicates that the Liebermann-Burchard (L-B) and Zak color reactions for cholesterol have similar oxidative mechanisms, each yielding, as oxidation products, a homologous series of conjugated cholestapolyenes. These studies further suggest that the colored species observed in these two systems are enylic carbonium ions formed by protonation of the parent polyenes. The effects of rate of carbonium ion formation and sulfuric acid concentration on sensitivity and color stability are discussed. A solvent extraction procedure is described for specifically converting cholesterol to 3,5-cholestadiene. Incorporating this step into the typical L-B method can increase the L-B sensitivity for cholesterol by several fold.

CONF-740708-27 PC$4.00/MF$2.25
Harbor General Hospital, Torrance, Calif.; Universidad Catolica de Chile, Santiago.
DECARBOXYLATION OF DL-DOPA STUDIED BY EXP 14 CO SUB 2 ANALYSIS IN PARKINSONIAN AND MANGANIC PATIENTS.
I. Mena, K. Z. Horiuchi, J. Court, and G. Lopez. 1973, 13p SM-185/2
U.S. Sales Only.

Descriptors: (*Dopamine, Metabolism), (*Metabolism, *Tracer techniques), (*Carbon 14, *Radiometric analysis), Breath, Carbon dioxide, Exhalation, Labelled compounds, Nervous system diseases, Patients, Sampling.

For abstract, see NSA 30 08, number 21459.

N74-30465/0GA PC$4.75/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
THE ENERGY ASPECT OF THE MECHANISM OF ENZYME ACTION.
J. Tonnelat. Aug 74, 34p NASA-TT-F-15835
Contract NASW-2481
Tran-Transl. Into English from Biochimie (France), V. 56, 1974 p 21-34.

Descriptors: *Activation energy, *Catalysis, *Enzymology, Biochemistry, Charge distribution, Enthalpy, Free energy.

For abstract, see STAR 1220

N74-30474/2GA PC$4.25/MF$2.25
Techtran Corp., Glen Burnie, Md.
ADAPTATION AS A FACTOR MODIFYING THE STABILITY OF ENZYMES.
V. I. Maksimov. Apr 74, 21p NASA-TT-F-15505
Contract NASW-2485
Tran-Transl. Into English from USP. Sovrem. Biol. (Moscow), V. 76, No. 1 (4), 1973 p 21-33.

Descriptors: *Activity (Biology), *Enzymes, *Stabilization, Adaptation, Culture techniques, Genetics, Literature, Physiochemistry.

For abstract, see STAR 1220

ORO-3861-13 PC$4.00/MF$2.25
Roswell Park Memorial Inst., Buffalo, N.Y.; Tennessee Univ., Knoxville Dept. of Physics.
DISPERSION EQUATION AND POLARIZABILITY OF BOVINE SERUM ALBUMIN FROM MEASUREMENTS OF REFRACTIVE INDICES.
M. Andersen, L. R. Painter, and S. Nir. 1973, 16p

Descriptors: (*Albumins, *Polarizability), Blood serum, Cattle, Dispersions, Equations, Refraction.

For abstract, see NSA 30 08, number 23384.

SRO-638-8 PC$5.25/MF$2.25
Georgia Univ., Athens Dept. of Biochemistry.
REGULATION OF ENZYME SYNTHESIS IN THE EMBRYOGENESIS AND GERMINATION OF COTTON. PROGRESS REPORT, JUNE 1973-JUNE 1974.
V. Walbot, B. Harris, and L. S. III Dure. 1974, 43p
Contract AT(38-1)-638

Descriptors: (*Cotton plants, *Growth), (*Seeds, *Germination), (*Enzymes, *Biosynthesis), Biochemical reaction kinetics, Embryonic cells, Messenger-rna, Plant cells, Proteins.

For abstract, see NSA 30 08, number 23388.

UR-3490-546 PC$4.00/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
HORMONAL REGULATION OF NET HAPTOGLOBIN BIOSYNTHESIS IN THE ISOLATED PERFUSED RAT LIVER.
L. L. Miller. 1974, 20p CONF-740532-1

Descriptors: (*Haptoglobins, *Biosynthesis), Biochemical reaction kinetics, Biological effects, Corticosteroids, Liver, Rats.

For abstract, see NSA 30 08, number 23395.

6B. Bioengineering

AD-785 742/8GA Reprint
Johns Hopkins Univ Baltimore Md
TRACKING AND INFORMATION TELEMETRY OF WILD ANIMALS: AQUATIC MAMMALS - PINNIPEDIA AND CETACEA.
Technical rept.,
G. Carleton Ray. 1 Sep 74, 6p Rept no. TR-2
Contract N00014-67-A-0163-0010
Availability: Pub. in Proceedings of International Telemetering Conference, International Foundation for Telemetering, Woodland Hills, California, 1971, p384-386.

Descriptors: *Cetacea, *Seals(Mammals), *Telemeter systems, Aquatic animals, Tracking, Radio transmission, Behavior, Physiology, Hydrology, Oceanographic data, Packaging, Detectors.
Identifiers: Animal migrations, *Biotelemetry.

The problems involved in attaching telemetry devices to marine mammals and in packaging these devices for the marine environment are discussed. The four categories of desired data are reviewed: track of animal's movements, behavioral/physiological correlates, navigational/orienitation correlates, and hydrological and oceanographic data. The sensors and components necessary to record the required data are listed. (Author)

AD-785 909/3GA Reprint
Johns Hopkins Univ Baltimore Md
NEW TAGGING AND TRACKING METHODS FOR THE STUDY OF MARINE MAMMAL BIOLOGY AND MIGRATION.
Technical rept.,
Kenneth S. Norris, William E. Evans, and G. Carleton Ray. 1 Sep 74, 17p Rept no. TR-8
Contract N00014-67-A-0163-0010
Availability: Pub. in the Whale Problem, Cambridge, p395-408 1974.

Descriptors: *Cetacea, *Telemeter systems, *Aquatic animals, Tracking, Whales, Radio transmission, Behavior, Satellites(Artificial), Packaging, Detectors, Physiology.
Identifiers: Animal migrations, *Biotelemetry, Marine mammals.

Three separate departures are discussed that are either operational or in design stages at present. Common to all three is the equipping of marine mammals with data packs and/or radio beacons. Methods range from the use of radios on small cetaceans for subsequent tracking by boat or aircraft to equipping marine mammals with recoverable packages for data from shorter time periods and to instrumenting large whales for satellite tracking. (Modified author abstract)

CEA-R-4534 PC$9.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France).
ACQUISITION AND PROCESSING METHOD FOR HUMAN SENSORIAL, SENSITIVE, MOTORY, AND PHONATORY CIRCUITS REACTION TIMES.
C. Doche. Jun 74, 120p

In French. U.S. Sales Only.

Descriptors: (*Nervous system, *Physiology), (*Man, Nervous system), Autonomic nervous system, Central nervous system, Electronic equipment, Ganglions, Measuring methods, Neurology, Sense organs, Stimuli.

For abstract, see NSA 30 08, number 23382.

N74-29461/2GA PC$3.75/MF$2.25
Methodist Hospital, Houston, Tex.
FABRICATION OF NEUROPHYSIOLOGICAL MONITORING SYSTEMS.
Final Report.
J. D. Frost, Jr.. Jun 74, 69p NASA-CR-2416
Contract NAS9-13065

Descriptors: *Bioinstrumentation, *Neurophysiology, Electroencephalography, Electromyography, Sleep.

For abstract, see STAR 1219

N74-29463/8GA PC$6.00/MF$2.25
Case Western Reserve Univ., Cleveland, Ohio. Engineering Desing Center.
MICROELECTRONIC BIOINSTRUMENTATION SYSTEM.
Annual Progress Report, Sep. 1973 - Aug. 1974.
W. H. Ko, E. T. Yon, and R. J. Rodriguez. 27 Jul 74, 59p NASA-CR-139216
Contract NGR-36-027-053

Descriptors: *Bioinstrumentation, *Microelectronics, Implanted electrodes (Biology), Ph, Radio frequencies, Research projects, Telemetry, Temperature measuring instruments.

For abstract, see STAR 1219

N74-30476/7GA PC$5.00/MF$2.25
Illinois Univ., Urbana. Dept. of Civil Engineering.
TOPOGRAPHY OF AORTIC HEART VALVES.
Final Report.
H. M. Karara. 1 Aug 74, 38p NASA-CR-139566, UILU-ENG-74-2017
Contract NAS9-12459

Descriptors: *Aorta, *Heart valves, *Prosthetic devices, Biomedical data, Data reduction, Digital simulation, Molds, Photogrammetry, Silicone rubber.

For abstract, see STAR 1220

N74-30491/6GA PC$12.25/MF$2.25
Orion Research, Inc., Cambridge, Mass.
AUTOMATED POTENTIOMETRIC ELECTROLYTE ANALYSIS SYSTEM.
Final Report.
14 Dec 73, 185p NASA-CR-134373, MSC-14627
Contract NAS9-12117

Descriptors: *Automatic control, *Blood, *Electrodes, *Electrolytes, *Gas detectors, *Weightlessness, Calcium, Electrochemistry, Feasibility analysis, Ph, Potassium, Sodium.

For abstract, see STAR 1220

PB-235 383/7GA PC$5.25/MF$2.25
California Univ., Berkeley. Dept. of Mechanical Engineering.
AN ENGINEERING ANALYSIS OF THE HUMAN SPINAL COLUMN.
Final rept.,
Robert F. Steidel, Jr., and Keith Markolf. 1974, 103p
Grant SRS-RD-3548

Descriptors: *Vertebrae, *Biomechanics, Bioengineering, Musculoskeletal system, Humans, Analyzing, Stresses, Models, Braces, Orthopedics, Tests, Loads(Forces), Experimental data.
Identifiers: Biomechanics.

The research project has been a two year effort to study the spinal column as an engineering structure and to apply this analysis to the specific problem of spinal bracing. There are two key areas of importance in spinal mechanics. The definition of forces, moments, or systems of forces and moments acting upon the spinal column, and the deformation of the intervertebral joint, under load. The experimental data were used to design and construct the mechanical model. It was instrumented to measure relative rotation at the intervertebral joint levels. The model spine was then inserted into a plastic body jacket and internally inflated into a mock-up of a human torso. Bending tests were performed both with this torso alone and with the torso and a lumbosacaral corset or chairback brace.

PB-236 052/7GA PC$7.00/MF$2.25
Case Western Reserve Univ., Cleveland, Ohio.
NORMAL AND ABNORMAL MOTOR CONTROL IN THE UPPER EXTREMITIES. A MEDICAL ENGINEERING STUDY.
Final rept., 1 Dec 66-30 Apr 70,
Charles Long. 1970, 177p SRS-2377-001
Grant SRS-RD-2377-M

Descriptors: *Electromyography, *Arm(Anatomy), Wrist, Hand(Anatomy), Muscles, Paralysis, Paraplegia, Wheel chairs, Electric control, Viscoelasticity, Mechanical properties, Communication equipment, Research.
Identifiers: *Myoelectric control systems, *Orthosis.

A three-year research program (1966-1970) studied electromyographic kinesiology of the hand, wrist, and shoulder which outlines the muscular control of the hand and muscular control of the wrist in relation to general hand movements; development and evaluation of new clinical devices for patients with severely paralyzed upper extremities, including single-channel myoelectric control systems, multichannel myoelectric control systems, a touchplate system for control of the electric wheelchair, and two communication devices; and viscoelastic and reflex contributions to resting tone in the normal, spastic, and rigid hand.

6C. Biology

AD-785 750/1GA Reprint
Johns Hopkins Univ Baltimore Md
ADOPTION OF A STRANGE PUP BY THE ICE INHABITING HARBOR SEAL, PHOCA VITULINA LARGHA.
Technical rept.,
John J. Burns, G. Carleton Ray, Francis H. Fay, and Peter D. Shaughnessy. 1 Sep 74, 9p Rept no. TR-4
Contract N00014-67-A-0163-0010
Availability: Pub. in Jnl. of Mammalogy, v53 n3 p594-598, 27 Sep 72.

Descriptors: *Seals(Mammals), Behavior, Aquatic animals, Mammals, Females.
Identifiers: *Animal behavior, Phoca largha, Marine mammals.

Ice-inhabiting harbor seals (Phoca vitulina largha) of the Bering Sea produce white-coated pups on the ice during late March and April. The seals pair prior to the birth of the pup and remain in pairs throughout the pupping season. A male pup weighing 18 kg and about two weeks of age was captured and held overnight in a dry crate, without being fed. Mid-afternoon of the following day, we sighted a pair of seals with a 28 kg male pup about four weeks old. The smaller, captive pup was dipped in the water in an effort to rinse off or dilute scents it might have acquired during its capture. It was placed on the floe and the larger pup was carried to the ship. The mother showed no signs of rejecting the pup, as one would expect if individual recognition were a factor in the mother-pup bond. Furthermore, the pup apparently did not identify the female as other than his own mother. (Modified author abstract)

AD-785 753/5GA Reprint
Johns Hopkins Univ Baltimore Md
COCCIDIOSIS IN HARBOR SEALS.
Technical rept.,
C. K. Hsu, E. C. Melby, Jr., N. H. Altman, and J. D. Burck. 1 Sep 74, 5p Rept no. TR-7
Contract N00014-67-A-0163-0010
Availability: Pub. in the Jnl. of the American Veterinary Medical Association, v164 n7 p700-701 1974.

Descriptors: *Seals, *Protozoa, *Sporozoa, Infectious diseases, Parasitic disease, Chemotherapy, Pathology, Liver, Intestines.
Identifiers: *Coccidia, Marine mammals, Histopathology.

Fecal examination of a 14-week-old, lethargic, anoretic harbor seal pup (Phoca vitulina concolor) revealed many unsporulated coccidian oocysts. Bacteriologic culture of rectal swab specimens yielded negative results for Salmonella and Shigella as well as for other bacterial pathogens. The pup died within a few days. At necropsy, gross lesions were observed only in the colon and liver. Twenty-one days later the second pup became anorectic and lethargic. Nine days later fecal smears revealed numerous large, unsporulated coccidian oocysts (Eimeria phocae). A combination of neomycin sulfate, sulfonamides, kaolin and ectin, and furazolidone were administered by stomach tube, twice a day, for five days. The pup recovered. (Modified author abstract)

AD-785 762/6GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
ALBINISTIC AND MELANISTIC MAMMALS FROM TAIWAN.
Special rept.,
Gwilym S. Jones. Dec 73, 6p Rept no. NAMRU-2-Sp-32
Availability: Pub. in Quarterly Jnl. of the Taiwan Museum, v26 n3/4 p369-372 Dec 73.

Descriptors: *Taiwan, *Pigments, *Mammals, Reviews, Rodents, Monkeys, Insectivora.
Identifiers: Albinism, Flying squirrels, Petaurista, Capricornis cripus, Cervus, Muntiacus reevesi, Macaca cyclops, Suncus murinus, Deer, Melanin.

The paper reviews the reports of albinistic animals on Taiwan. The following are animals listed as albinistic or partially albinistic: Petaurista sp., Capricornis crispus, Cervus sp., Muntiacus reevesi, Melogale moschata, Macaca cyclopis, Suncus murinus. (Author)

AD-785 763/4GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
SELECTIVE ROOSTING OF 'PTEROPUS ARQUATUS'.
Special repts.,
Gwilym S. Jones. 1973, 3p Rept no. NAMRU-2-SP-33
Availability: Pub. in Malayasian Nature Jnl., v26 p55 1973.

Descriptors: *Bats, Indonesia, Distributions.
Identifiers: Pteropus arquatus.

In Sulawesi, Indonesia Pteropus arquatus were observed on two ocassions which extends the range of the bats 100 miles south of previous reports. (Author)

AD-785 764/2GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)

CHROMOSOMES OF TWO SPECIES OF MUS FROM SOUTHEAST ASIA.
Special rept.,
John F. Duncan. 1973, 5p Rept no. NAMRU-2-SP-34
Availability: Pub. in Chromosome Information Service, n15 p18-20 1973.

Descriptors: *Southeast Asia, *Chromosomes, *Mice, Genetics, Cytology.
Identifiers: Mus caroli, Mus cervicolor.

The essential similarity of karyotypes from all Mus checked was probably predictable, but nonetheless disappointing, inasmuch as species of Southeast Asia Mus are differentiated with difficulty by conventional museum methods. The status of members of this genus has been vague.

AD-785 766/7GA Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
THE 'AMBLYOMMA' (ACARINA: IXODIDAE) PARASITIC ON GIANT TORTOISES (REPTILIA: TESTUDINIDAE) OF THE GALAPAGOS ISLANDS,
James E. Keirans, Harry Hoogstraal, and Carleton M. Clifford. 7 Nov 72, 19p Rept no. NAMRU-3-TR-7-74
Also pub. as Charles Darwin Foundation for the Galapagos Isles, Brussels (Belgium). Contrib-158.
Availability: Pub. in Annals of the Entomological Society of America, v66 n3 p673-688 1973.

Descriptors: *Ticks, *Reptiles, *Ecuador, Insects, Parasites, Hosts(Biology), Life cycles.
Identifiers: Amblyomma usingeri, Amblyomma macfarlandi, Amblyomma pilosum, Host parasite relations, Geochelone elephatopus, Tortoises.

A study of ticks from giant tortoises, Geochelone elephantopus subspp., in the Galapagos Islands revealed Amblyomma species parasitizing this host: A. usingeri, n.sp., A. macfarlandi, n.sp., and A. pilosum Neumann. Each active stage in the life cycle of these species is described and illustrated. Amblyomma boulengeri Hirst and Hirst, previously incorrectly considered to be synonymous with A. pilosum (sensu Robinson), is a distinct species parasitic on land iguanas and lava lizards. (Author)

AD-785 775/8GA Reprint
Iowa State Univ Ames
'IXODES (PARTIPALPIGER) OVATUS' NEUMANN, SUBGEN. NOV.: IDENTITY, HOSTS, ECOLOGY, AND DISTRIBUTION (IXODOIDEA: IXODIDAE),
Harry Hoogstraal, Carleton M. Clifford, Yutaka Saito, and James E. Keirans. 1973, 11p NAMRU-3-TR-10-74
Contract N00014-68-A-0101-0001
Prepared in cooperation with National Inst. of Allergy and Infectious Diseases, Hamilton, Mont. Rocky Mountain Lab. and Niigata Univ. (Japan). Dept. of Medical Zoology.
Availability: Pub. in Jnl. of Medical Entomology, v10 n2 p157-164, 25 Apr 73.

Descriptors: *Ticks, Hosts(Biology), Entomology, Ecology, Taxonomy, Distribution, Identification, Asia.
Identifiers: *Ixodes ovatus.

Examination of numerous adult and immature specimens of Ixodes ovatus Neumann from Nepal and reared material from Japan has disclosed a number of unique and unusual features of both the adult and immature stages. Because of the magnitude of these differences, a new subgenus, Partipalpiger, is proposed to contain I. ovatus. Details on the hosts, distribution, and general ecology of this species in Asia are also given. (Author)

AD-785 776/6GA Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
THE FLEAS (SIPHONAPTERA) OF EGYPT. EARLY RECORDS FROM MAMMALS,
Gleen E. Hass, and P. Quinton Tomich. 1973, 21p Rept no. NAMRU-3-TR-11-74
Availability: Pub. in Jnl. of the Egyptian Public Health Association, v48 n1/2 p1-15 1973.

Descriptors: *Insects, *Taxonomy, HOsts(Biology), Mammals, Egypt, Parasites, Surveys.
Identifiers: *Fleas, *Siphonaptera, Parasite host relations.

Sixteen species of fleas are recorded from 19 species of mammals in Egypt. Nearly all specimens were collected in a 1946-1947 parasite survey under the auspices of NAMRU-3. Three flea-host associations are reported as new for Egypt. (Author)

AD-785 787/3GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
KARYOTYPES OF FIVE TAXA OF RATTUS (RODENTIA: MURIDAE) FROM INDONESIA.
Technical rept.,
John F. Duncan, Ratna Irsiana, and Anni Chang. 30 Oct 72, 11p Rept no. NAMRU-2-TR-605
Availability: Pub. in Cytologia, v39 p295-302 1974.

Descriptors: *Indonesia, *Rats, *Chromosomes, Profiles, Rodents, Bone marrow, Cytology, Genetics.
Identifiers: Rattus bartelsii, Rattus treubii, Rattus lepturus, Rattus temmincki, Rattus cretaceiventer, *Karyotypes.

Karyotypes of the following taxa are described: Rattus bartelsii, Rattus niviventer temmincki, Rattus niviventer treubii, Rattus cremoriventer cretaceiventer, and Rattus fulvescens lepturus. (Author)

AD-785 800/4GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
OBSERVATION ON RATTUS BARTELSII (RODENTIA: MURIDAE).
Technical rept.,
P. F. D. Van Peenen, R. H. Light, F. J. Duncan, R. See, and J. Sulianti Saroso. 1974, 39p Rept no. NAMRU-2-TR-607
Availability: Pub. in Treubia, v28 pt3 p83-117 1974.

Descriptors: *Rats, Taxonomy, Morphology(Biology), Ecology, Distribution, Mammals, Southeast Asia.
Identifiers: Rattus bartelsii.

The paper describes a taxonomically important Javanese rat, Rattus bartelsii. Descriptions are based on collection and examination of more than 200 specimens from the Mt. Gede-Mt. Pangerango area of West Java. Literature pertaining to the species is reviewed and results of examination of specimens housed in European museums are given. The rat lives in highland rain forests of West and Central Java. It has distinctive morphological features which preclude its being placed in classification groups heretofore suggested for it. Named subspecies are considered invalid. (Author)

AD-785 807/9GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
IN VITRO CULTIVATION OF FASCIOLOPSIS BUSKI.
Technical rept.,
C. T. Lo, and John H. Cross. Jun 74, 12p Rept no. NAMRU-2-TR-612
Availability: Pub. in the Southeast Asian Jnl. of Tropical Medicine and Public Health, v5 n2 p252-257 Jun 74.

Descriptors: *Trematodes, In vitro analysis, Swine, Culture media, pH factor, Cultures(Biology), Intestinal parasitosis.
Identifiers: Gasciolopsis buski.

Adults of Fasciolopsis buski obtained from a pig were cultured in artificial media at 37C, pH 7.2-7.4 without agitation. Ten worms cultured in Rohrbacher's saline survived from 9-20 days, averaging 13.2 days. Death was mainly attributed to changes in the pH. When pig serum was added to Rohrbacher's saline, the pH change became less pronounced. The addition of yeast extract and pig serum had little effect on survival of the worm, while an adverse effect was observed when lactalbumin hydrolysate and pig serum were added. Earle's solution was less satisfactory then Rohrbacher's saline. In medium 199 the worms survived for 6-8 days and when supplemented with pig serum some worms survived for a day or two longer. After prolonged cultivation testicular contents were lost and the vitelline follicles disappeared. (Modified author abstract)

AD-785 861/6GA PC$3.25/MF$2.25
Georgetown Univ Washington D C Dept of Biology
THE EFFECT OF PRIOR IN SITU COOLING ON THE VIABILITY OF THE EXCISED HEART.
Final technical rept.,
J. A. Panuska. 15 Sep 74, 16p
Contract N00014-69-A-0220-0005

Descriptors: *Heart, *Cryobiology, *Hypothermia, In vitro analysis, Viability, Preservation, Tissues(Biology), Organs(Anatomy).
Identifiers: *Tissue preservation.

Methods for the preservation of isolated organs have rarely considered the capacities for physiological adaptation possessed by living material. The primary purpose of this study was to determine if there is improved viability of an isolated perfused heart if the donor has been exposed previously to cold stress either in the form of long term environmental exposure or short term hypothermia. Following special treatments of donor rabbits, isolated hearts were maintained under pulsatile perfusion using the Lindbergh-Carrel perfusion system. In these experiments cold acclimation and prior hypothermia did not contribute significantly to the viability of the isolated hearts. Other evidences, based on whole animal studies, continue to suggest that prior exposure of the whole animal conditions allowing acclimation to stress might also provide individual organ acclimation and therefore assist organ preservation attempts. The authors isolated organ studies did not support this supposition. (Modified author abstract)

AD-785 873/1GA PC$3.25/MF$2.25
Johns Hopkins Univ Baltimore Md
ABSTRACTS OF PAPERS PRESENTED AT SCIENTIFIC MEETINGS.
Technical rept.,
G. Carleton Ray, Douglas Wartzok, and H. B. Martin. 1 Sep 74, 8p Rept no. TR-1
Contract N00014-67-A-0163-0010

Descriptors: *Meetings, *Seals, *Marine biology, Abstracts, Underwater sound, Telemeter systems, Carbon dioxide, Hypoxia, Blood circulation, Respiration.
Identifiers: *Marine mammals, Animal Communication, Animal behavior, Biotelemetry.

Three abstracts of papers presented at scientific meetings are combined in this report. The titles of the abstracts are: Social function of phonation in walrus; A recording instrument package designed for use with marine mammals; Effects of CO2 breathing and hypoxia on venous return in the harbor seal (Phoca vitulina concolor).

AD-785 966/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THE TECHNIQUE OF GEOBOTANICAL MAPPING IN NORTH CENTRAL SIBERIA,
A. N. Lukicheva. 15 Nov 73, 14p Rept no. FSTC-HT-23-1300-73

Trans. of mono. Krupnomashtabnoe Kartografirovanie Restitelnosti (Large-Scale Mapping of Vegetation), Novosibirsk, 1970 p124-132, by Markowitz.

Descriptors: *Vegetation, *Siberia, Tectonics, Geology, Lithology, Mapping, Plants(Botany), USSR, Translations.
Identifiers: *Geobotany.

The highly variegated environmental conditions of North Central Siberia make for vegetative cover that is not uniform. This complicates the task of defining basic units of vegetation for the purpose of mapping. But the distribution of vegetation is closely related to certain factors in the physical geographic environment, including lithology, geostructure, relief dissection, and neotectonics. Materials documenting these factors can be an important aid in interpreting and mapping vegetation on various scales.

AD-786 044/8GA PC$3.75/MF$2.25
Illinois State Natural History Survey Urbana
THE EFFECT OF SHORT-TERM WEATHER CONDITIONS ON THE MIGRATION OF WATERFOWL.
Final rept.,
Frank C. Bellrose. Apr 74, 48p FAA-RD-74-72
Contract FA69WAI-168

Descriptors: *Migration, *Weather, *Birds, Regression analysis, Seasonal variations, Correlation techniques, Meteorological data, Meteorological charts, Illinois.
Identifiers: *Ducks, Anas platyrhynchos, Aythya valisineria, Mississippi River Valley, Peoria(Illinois).

The effect of weather conditions on the fall migration of seven duck species was studied in the Illinois and Mississippi River Valleys of Illinois, October 1-December 5, 1948-1968, and on observed flock arrival and departure dates. Arrivals were treated as if the ducks departed Fargo, ND, the evening before they arrived, and departures were related to weather conditions at Peoria, IL. A stepwise multiple regression equation was used to evaluate the effect of weather elements on duck departures. Correlations were highest for mallards (Anas platyrhynchos) and canvasbacks (Aythya valisineria). Since correlation of weather conditions with duck departures generally was low, endogenous (physiological) factors apparently affected departure time more than exogenous (environmental) ones. Temperature and pressure were the weather elements most frequently associated with duck departures. (Modified author abstract)

AD-786 054/7GA Reprint
Naval Dental Research Inst Great Lakes Ill
UNERUPTED DENTITION SECONDARY TO CONGENITAL OSTEOPETROSIS IN THE OSBORNE-MENDEL RAT,
William R. Cotton, and James F. Gaines. 1 Feb 74, 12p Rept no. NDRI-PR-74-06
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v146 p554-561 1974.

Descriptors: *Musculoskeletal diseases, *Teeth, *Rats, Laboratory animals, Mutations, Genetics, Scientific research, Dentistry, Biology, Medicine.
Identifiers: Congenital abnormalities.

The report describes a new mutant rat with a skeletal disorder, apparent normal longevity, and unerupted molar and incisor dentition. The mutation has been assigned the sumbol tl for 'toothless'. The strain/substrain designation for the proposed strain is TLOM/Ndri. (Author)

AD-786 124/8GA PC$12.00/MF$2.25
Naval Inspector of Ordnance Silver Spring Md
BIBLIOGRAPHY OF TICKS AND TICKBORNE DISEASES FROM HOMER (ABOUT 800 B. C.) TO 31 DECEMBER 1973. VOLUME 5. PART 1.
Special publication,
Harry Hoogstraal, and Alice Djigounian. Aug 74, 499p* Rept no. NAMRU-3-MZ507-Vol-5-Pt-1
See also Volume 4, AD-745 329.

Descriptors: *Ticks, *Bibliographies, *Disease vectors, Entomology, Infectious diseases, Periodicals, Medical research, Indexes, Microbiology, Scientists.

Contents:
Introduction and remarks;
Additions to volumes 1 to 4;
Bibliography of ticks and tickborne diseases for years 1970, 1971, 1972, and 1973;
Late additions to this bibliography.

AD-786 142/0GA PC$4.25/MF$2.25
Missouri Dept of Conservation Jefferson City
EVALUATION OF THREE SIDE CHANNELS AND THE MAIN CHANNEL BORDER OF THE MIDDLE MISSISSIPPI RIVER AS FISH HABITAT.
Final rept.,
Daniel V. Ragland. Mar 74, 70p AEWES-CR-Y-74-1
Contract DACW39-73-C-0012

Descriptors: *Channels(Waterways), *Ecology, *Aquatic animals, *Aquatic plants, Fishes, Plankton, Sampling, Habitability, Feeding, Acclimatization, Fresh water, Abundance.
Identifiers: *Mississippi River, Benthos, Ecosystems, Evaluation, Fresh water fishes.

The importance of side channels and main channel borders as fish habitat was evaluated in three representative areas of the Middle Mississippi River. Fish, benthos, and plankton were collected during five seasonal samples in 1972-1973. Benthic organisms generally occurred in greater numbers in the main channel border habitat. No significant differences were observed between side channels and main channel borders for combined planktonic taxa. Minnows and small fish were nearly 6.0 times more abundant in seine collections from the side channels than in main channel borders. For the more abundant fish species, electrofishing and netting captured significantly more carp, bluegill, shortnose gar, black crappie, bigmouth buffalo, white crappie, and bowfin in the side channels than in adjacent main channel borders. Largemouth bass were found only in the side channels. Significantly greater numbers of freshwater drum were observed in main channel borders. Both the side channels and main channel border areas were important as fish habitat. Adverse environmental conditions and the relatively short duration of the project prevented assessment and documentation of the complete ecological relationship of these integral parts of a large riverine ecosystem. (Modified author abstract)

AD-786 162/8GA Reprint
Armed Forces Inst of Pathology Washington D C
CONSTANCY OF A 200 A FIBER IN HUMAN CHROMATIN AND CHROMOSOMES,
Gunter F. Bahr, and Harvey M. Golomb. 18 Mar 74, 9p
Revision of report dated 28 Jan 74.
Availability: Pub. in Chromosoma (Berl.), v46 p247-254 1974.

Descriptors: *Chromosomes, Fibers, Mass, Cell division, Cytology, Genetics, Colchicine.
Identifiers: *Chromatin.

The diameter of 200 A for modal chromatin fibers in unstimulated and stimulated peripheral human lymphocytes remains constant within a range of 5% throughout the cell cycle (including metaphase). Fiber dry mass varies slightly more, but its average of 6 x 10 to the minus 16th power grams per micron remains constant also. -- The use of colchicine induces metaphase fibers to shorten and results in a fiber mass per unit length increase of up to twofold. This change does not appear to be related to any change in total chromosomal mass. Fiber shortening, consequently and, with it, shortening of the chromosome are considered to be essentially conformational events. (Author)

AD-786 163/6GA Reprint
Armed Forces Inst of Pathology Washington D C
ELECTRON MICROSCOPY OF HUMAN INTERPHASE NUCLEI. DETERMINATION OF TOTAL DRY MASS AND DNA-PACKING RATIO,
H. M. Golomb, and G. F. Bahr. 18 Mar 74, 14p
Revision of report dated 28 Jan 74.
Availability: Pub. in Chromosoma (Berl.) v46 p233-245 1974.

Descriptors: *Electron microscopy, *Cytology, *Deoxyribonucleic acids, *Chromosomes, Nucleic acids, Nuclei(Biology), Cell structure, Lymphocytes, Quantitative analysis, Mass.
Identifiers: *Chromatin, Molecular biology.

The ratio of fiber length to length of DNA, the DNA-packing ratio, is analyzed from trough-spread, critical-point-dried lymphocyte nuclei by using both quantitative electron microscopic dry mass determinations and measurements of size. Total nuclear dry mass, the mass of portions of chromatin fibers, and fiber diameters are being determined. A packing ratio of 28.3 is found with these exacting methods and correlated to model concepts of DNA super-coiling necessary to achieve required packing.

COM-74-11452/1GA Reprint (PC$3.25
South Carolina Wildlife and Marine Resources Dept., Charleston. Marine Resource Center.
A SIMPLE AIRLIFT-OPERATED TANK FOR CLOSED-SYSTEM CULTURE OF DECAPOD CRUSTACEAN LARVAE AND OTHER SMALL AQUATIC ANIMALS,
P. A. Sandifer, P. B. Zielinski, and W. E. Castro. 1974, 8p Contrib-14, SC-Sea Grant-TRS-1 NOAA-74080602
Grant NOAA-NG-33-72
Sponsored in part by Coastal Plains Regional Commission, Washington, D.C. Prepared in cooperation with Clemson Univ., S.C. Dept. of Engineering Mechanics. Summary in German.
Pub. in Helgolaender wiss. Meeresunters, v26 p82-87 1974.

Descriptors: *Crustacea, *Aquaculture, Larvae, Invertebrates, Aquatic animals, Tanks(Containers), Circulation.
Identifiers: Decapoda, Macrobachium rosenbergii, Sea Grant program.

A rectangular tank for culture of decapod crustacean larvae with continuous water recirculation is described. The tank has a sloped bottom and an attached gravel filter unit. Water circulation through the filter serves at the same time for maintaining food particles in suspension and for dispersing the larvae; it is accomplished by airlift pumps. Tanks of this design have been used successfully for closed system culture of larvae of the prawn Macrobachium rosenbergii and are expected to be satisfactory for other small aquatic animals.

COM-74-11541/1GA Reprint
Louisiana State Univ., Baton Rouge. Dept. of Food Science.
UTILIZATION OF ECONOMICALLY-VALUABLE BYPRODUCTS FROM THE SHRIMP PROCESSING INDUSTRY,
Samuel P. Meyers, and James E. Rutledge. 1973, 13p NOAA-74090405
Grant NOAA-2-35231
Pub. in Proceedings of the Marine Technology Society, Food--Drugs from the Sea, 1972 p75-85 1973.

Descriptors: *Shrimps, *Food processing, *Food industry, Shellfish, Byproducts, Diets, Fish meal, Crustacea, Proteins, Amino acids, Nucleotides.
Identifiers: Sea Grant program.

Current investigations in the Department of Food Science at Louisiana State University involve efforts to more effectively utilize the byproducts of shrimp cannery operations and other shrimp processing facilities in the Gulf area. Attention is being given to incorporation of shrimp meal into diets for economically-valuable crustaceans in aquacultural operations. Studies with other crustacean meals are also in progress. Cannery discharges and blanching water systems are being analyzed for recovery of proteinaceous material as well as particular organics such as nucleotides and amino acids. Salient features of these investigations are reported.

COM-74-11545/2GA PC$4.25/MF$2.25
Washington Univ., Seattle. Div. of Marine Resources.
A HYDROACOUSTIC DATA ACQUISITION AND DIGITAL DATA ANALYSIS SYSTEM FOR THE ASSESSMENT OF FISH STOCK ABUNDANCE,
Edmund Pierce Nunnalle, Jr. May 74, 56p WSG-74-2 NOAA-74082202
Grant NOAA-04-3-158-42
Report on Washington Sea Grant Program.

Descriptors: *Fishes, Abundance, Data acquisition, Echo sounding, Acoustic detection, Pelagic zone, Assessments, Underwater acoustics.
Identifiers: Sea Grant program.

A hydroacoustic data acquisition and digital data analysis system has been designed and constructed at the University of Washington, Seattle, to measure the abundance of pelagic fish. The portable data acquisition unit consists of an echo sounder interfaced to a magnetic tape recorder. The digital data analysis unit incorporates a small computer, a line printer, and various hardware to interface the computer to an echo sounder or a tape player. The paper was written to provide a basic operators manual for the hydroacoustic data acquisition and analysis system and to compile various publications relative to its use. General descriptions, instructions for use, and theory of operation are given for each major component of the system. Several methods for the analysis of recorded hydroacoustic data are also included.

COM-74-11546/0GA PC$3.25/MF$2.25
Louisiana Wild Life and Fisheries Commission, New Orleans.
REHABILITATION OF NATURAL OYSTER SEED GROUNDS DESTROYED OR DAMAGED BY A NATURAL DISASTER.
Completion rept. Oct 73-Aug 74,
Max W. Summers. Jul 74, 12p NOAA-74081304

Descriptors: *Oysters, *Aquaculture, *Reclamation, Shellfish, Clams, Reproduction(Biology), Disasters, Louisiana.
Identifiers: Oyster culich.

Dredge-run clam shell no smaller than 3/8-inch diameter was planted in May and June of 1974 to provide oyster cultch for the oyster fishermen's use in September of 1975 and in subsequent years. Clam shells were washed overboard using six high-pressure water hoses powered by three diesel pumps with about 90 psi pressure on a 1.25-inch nozzle. A total of 1,144 superficial acres were planted with 61,367.31 cubic yards of clam shell in 25 days at a cost of $283,173.30. Periodically, clam shells were dredged and oyster spat were counted, measured, and recorded. (Modified author abstract)

COM-74-11564/3GA PC$5.75/MF$2.25
Minnesota Univ., St. Paul. Dept. of Entomology, Fisheries and Wildlife.
FISHERY RESOURCES OF LAKE FOR THE WOODS, MINNESOTA,
Eugene G. Heyerdahl, and Lloyd L. Smith, Jr. 1972, 145p NOAA-74082603
Also pub. as Minnesota Agricultural Experiment Station, St. Paul. Technical Bulletin-288.

Descriptors: *Fisheries, *Lake of the Woods, *Recreation, Fresh water fishes, Abundance, Identifying, Commercial fishing, Weight, Proteins, Feeding stuffs, Management, Fishing equipment, Minnesota, Canada.
Identifiers: *Sport fishing.

The report is a summary of the LW-RL Commission's survey of the Lake of the Woods Commercial Fishery conducted by the University of Minnesota. The specific objectives were to determine: (1) The population structure of the various sport and commercial fish species in the lake; (2) the catch characteristics with reference to size and age of the fish species taken by the trawl, gill, trap, pound, and fyke net fisheries; (3) whether or not certain commercial fish species could be exploited more heavily to the advantage of both total protein production and sport fish yield; (4) the effect that stopping the commercial fish harvest would have on the sport fishery; (5) which types of commercial gear are most successful in catching the various commercial fish species; (6) the effects of various commercial gears on game fish species; and (7) the type of utilization that will give maximum sport fishing together with maximum protein production from the lake.

COM-74-50277-07/GA PC-GPO/MF$2.25-NTIS
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES ABSTRACTS. VOLUME 27, NUMBER 7, JULY 1974.
Monthly pub.
Jul 74, 44p NOAA-CFABA-27(7) NOAA-74071708
Paper copy available from GPO $6.50/year, $0.65/copy.

Descriptors: *Marine fisheries, *Bibliographies, Abstracts, Reviews, Aquaculture, Pollution, Ecology, Marine biology, Biochemistry, Oceanographic data, Fishing, Fish stocks.

Marine Fisheries Abstracts' contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

COM-74-50849/0GA PC-GPO/MF$2.25-NTIS
National Marine Fisheries Service, Seattle, Wash.
PROCEEDINGS OF THE U.S.-JAPAN MEETING ON AQUACULTURE (1ST) HELD AT TOKYO, JAPAN ON OCTOBER 18-19, 1971 UNDER THE SPONSORSHIP OF THE U.S.-JAPAN COOPERATIVE PROGRAM IN NATURAL RESOURCES (UJNR),
William N. Shaw. Feb 74, 145p NOAA-TR-NMFS-CIRC-388 NOAA-74080201
Paper copy available from GPO $1.65 as C55.13:NMFS-CIRC-388.

Descriptors: *Fisheries research, *Aquaculture, *Meetings, Shellfish, Fresh water fishes, Sea grasses, Fish farming, Genetics, Algae, Breeding, Crustacea, Mollusca, Oysters, Marine fishes, United States, Japan.
Identifiers: Sea Grant program.

The following papers constitute the proceedings of the First U.S. - Japan Meeting on Aquaculture at Tokyo, Japan, October 18-19, 1971: Present status of major marine cultivation and propagation in Hokkaido and some problems of the research activities; mariculture of seaweeds and its problems in Japan; Some technical problems in freshwater fish culture in Japan; the present status of shellfish culture in Japan; fish farming and constraints in Japan; larval culture of penaeid shrimp at the Galveston Biological Laboratory; aquaculture in the National Sea Grant Program; aquaculture of molluscs along the United States Atlantic and Gulf coasts; freshwater fish culture in the United States; genetics of the american oyster, Crassostrea virginica; recent developments in shellfish culture on the U.S. Pacific coast; seaweed culture in Japan; freshwater fish culture in Japan; shellfish culture in Japan; crustacean culture; marine fish culture in Japan; some impressions regarding genetics and the fisheries of Japan.

COM-74-50849-01/GA
(Order as COM-74-50849)
Hokkaido Regional Fisheries Research Lab., Yoichi (Japan).
PRESENT STATUS OF MAJOR MARINE CULTIVATION AND PROPAGATION IN HOKKAIDO AND SOME PROBLEMS OF THE RESEARCH ACTIVITIES,
Yoshio Hasegawa, and Yukimasa Kuwatani. Feb 74, 5p NOAA-74080201-1
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p3-6 Feb 74, COM-74-50849.

Descriptors: *Shellfish, *Aquaculture, Mollusca, Clams, Algae, Sea urchins, Echinodermata, Sea grasses, Japan.
Identifiers: Hokkaido(Japan), Abalones, Kelp.

The present status of major marine cultivation and propagation in Hokkaido and some problems of research on the productivity of scallops, the Japanese surf clam, abalone, the sea urchin, kelp and algae are discussed.

COM-74-50849-03/GA
(Order as COM-74-50849)
Freshwater Fisheries Research Lab., Tokyo (Japan).
SOME TECHNICAL PROBLEMS IN FRESHWATER FISH CULTURE IN JAPAN,
Hiroshi Kawatsu. Feb 74, 7p NOAA-74080201-3
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p17-22 Feb 74, COM-74-50849.

Descriptors: *Fresh water fishes, *Aquaculture, Carp, Eels, Trout, Fish stocking, Production.
Identifiers: Ayu.

Following a discussion of the present status of freshwater fish production consideration is given to some technical problems in production of carp, eel, rainbow trout, and ayu. Also considered are the production of native trout fingerlings for stocking in natural waters and the transplantation of foreign species suitable to the Japanese tastes.

COM-74-50849-04/GA
(Order as COM-74-50849)
Tohoku Regional Fisheries Research Lab., Shiogama (Japan).
THE PRESENT STATUS OF SHELLFISH CULTURE IN JAPAN,
Hisashi Kan-No, and Tomoo Hayashi. Feb 74, 4p NOAA-74080201-4
Prepared in cooperation with National Pearl Research Lab., Ago (Japan).
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p23-25 Feb 74, COM-74-50849.

Descriptors: *Shellfish, *Aquaculture, Oysters, Clams, Mollusca, Demand(Economics), Fishing products, Commercial fishing, Ocean industries, Japan.
Identifiers: Pearl industry.

In 1969, shellfish production (including pearl oysters) in Japan was 561,132 tons worth 58,444 million yen. Types of shellfish products landed during the past decade have changed because of certain effects on the environment and changes in commercial demands. Shellfish, like Meretrix, which live along the coastal area, have decreased remarkably in production because of the loss of their habitat from industrialization. In 1969, the oyster industry in the Seto Inland Sea area was seriously affected because the oysters were heavily fouled by the calcareous tube worm, Hydroides norvegica. For the past several years, production in the pearl industry has declined because of reduced demand for pearls. Landings of scallops, abalone, and top shell, so-called high grade products, have been increasing yearly both in tonnage and value because of the demand by the consumer for fresh marine products.

COM-74-50849-05/GA
(Order as COM-74-50849)
Nansei Regional Fisheries Research Lab., Maruishi (Japan).
FISH FARMING AND THE CONSTRAINTS IN JAPAN,
Masaru Fujiya. Feb 74, 6p NOAA-74080201-5
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p27-32 Feb 74, COM-74-50849.

Descriptors: *Fish farming, *Japan, Aquaculture, Fish stocking, Fish nutrition, Fish diseases, Feeding stuffs, Reproduction(Biology).

The essence and significance of fish farming in Japan are described and information is given on two types of fish farming. Present and/or proposed farming fisheries could be classified into two types: Stock recruitment and artificial control. After considering seedling production the constraints and problems are discussed. Although fish farming is in progress in Japan, some problems and constraints remain. Technical constraints include problems concerning seedling production, nutrition of larvae, disease and parasite control, and feeding. Among these, seedling production techniques are being developed rapidly, and experience with the successful culture of several species should be applicable in the future to other species.

COM-74-50849-06/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Galveston, Tex. Gulf Coastal Fisheries Center.
LARVAL CULTURE OF PENAEID SHRIMP AT THE GALVESTON BIOLOGICAL LABORATORY,
Cornelius R. Mock. Feb 74, 9p Contrib-344 NOAA-74080201-6
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), P33-40 Feb 74, COM-74-50849.

Descriptors: *Shrimps, *Aquaculture, Larvae, Identifying, Biological laboratories, Fish nutrition, Diets, Feeding stuffs, Marine biology, Mexico Gulf.
Identifiers: Penaeus setiferus, Penaeus aztecus, Penaeus duorarum.

The first larval culture experiments at the National Marine Fisheries Service Galveston Laboratory were conducted to aid the identification and description of the larval stages of penaeids found in the Gulf of Mexico. By 1966 the three commercially important penaeid shrimp (white shrimp, Penaeus setiferus; brown shrimp, P. aztecus; and pink shrimp, P. duorarum) had been reared to the post-larval stage. Research was directed toward developing methods of rearing penaeid larvae en masse in order to supply shrimp grown under known conditions for physiological studies and for experimental pond culture.

COM-74-50849-07/GA
(Order as COM-74-50849)
National Oceanic and Atmospheric Administration, Rockville, Md. Office of Sea Grant.
AQUACULTURE IN THE NATIONAL SEA GRANT PROGRAM,
Robert D. Wildman. Feb 74, 17p NOAA-74080201-7
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p41-56 Feb 74, COM-74-50849.

Descriptors: *Aquaculture, *Fisheries, *Shellfish, Research projects, Crustacea, Shrimps, Crabs, Lobsters, Mollusca, Grants, Crayfishes, Oysters, Clams, Octopuses, Dolphins(Mammals), Sea grasses, Marine fishes.
Identifiers: Sea Grant program.

A brief review of aquaculture projects carried on by the U.S. National Sea Grant Program is presented. The projects dealt with Crustaceans: Shrimp, crabs, lobsters, crayfish; and with Molluscs: oysters, clams, scallops, abalone, octopus and limpets. Other projects dealt with Finfish: salmonids, striped mullet, dolphins; and with seaweeds and marine pathology.

COM-74-50849-08/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Oxford, Md. Middle Atlantic Coastal Fisheries Center.
AQUACULTURE OF MOLLUSCS ALONG THE UNITED STATES ATLANTIC AND GULF COASTS,
William N. Shaw. Feb 74, 10p NOAA-74080201-8
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p57-65 Feb 74, COM-74-50849.

Descriptors: *Mollusca, *Aquaculture, *Coasts, Oysters, Clams, Shellfish, Pelecypoda, Invertebrates, Reviews, Atlantic Ocean, Mexico Gulf.
Identifiers: Crassostrea virginica, Mercenaria mercenaria, Aequipecten irradians.

A review is presented of the past and present status of mulluscan aquaculture. The discussion centers on three species of molluscs, the Eastern oyster, Crassostrea virginica; the hard clam, Mercenaria mercenaria; and the bay scallop, Aequipecten irradians.

COM-74-50849-09/GA
(Order as COM-74-50849)
Bureau of Sport Fisheries and Wildlife, Washington, D.C. Div. of Fish Hatcheries.
FRESHWATER FISH CULTURE IN THE UNITED STATES,
Harvey Willoughby. Feb 74, 9p NOAA-74080201-9
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p67-74 Feb 74, COM-74-50849.

Descriptors: *Fresh water fishes, *Aquaculture, Fish diseases, United States, Fisheries.
Identifiers: Bait fish.

An overview is presented on freshwater fish culture in the United States. Information is given on the level of fish production, types of fish culture, disease control, fish transportation and training schools. Brief comments are included on the Tehama-Colusa multipurpose water diversion project and spawning channel in California. In particular, details are given on the walleye, muskellunge, northern pike, channel catfish, striped bass, and bait fish.

COM-74-50849-10/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Milford, Conn. Middle Atlantic Coastal Fisheries Center.
GENETICS OF THE AMERICAN OYSTER, 'CRASSOSTREA VIRGINICA' GMELIN,
A. Crosby Longwell. Feb 74, 14p NOAA-74080201-10
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p75-87 Feb 74, COM-74-50849.

Descriptors: *Oysters, *Genetics, Breeding, Irradiation, Chromosomes, Hybridization, Reproductive system.
Identifiers: *Crassostrea virginica.

In summarizing present understandings of the genetics of the American oyster, Crassostrea virginica, information is given on the chromosome basis of the breeding system, inbreeding and its effects and the species mating system, selective breeding, hybridization, and the effects of ionizing irradiation.

COM-74-50849-11/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Seattle, Wash. Northwest Region.
RECENT DEVELOPMENTS IN SHELLFISH CULTURE ON THE U.S. PACIFIC COAST,
John B. Glude. Feb 74, 8p NOAA-74080201-11
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p89-95 Feb 74, COM-74-50849.

Descriptors: *Shellfish, *Aquaculture, Oysters, Clams, Invertebrates, Demand(Economics), Water quality, Water pollution, Coasts, Estuaries, Pacific Ocean.
Identifiers: Crassostrea gigas.

Oyster production on the U.S. Pacific coast is limited by demand, but the potential exists for greatly increased harvests through application of modern methods of aquaculture. Clam production is limited by natural supply. Clam farming has not been developed but, now that seed of at least one species is available, it is likely that commercial clam culture will develop rapidly in the Pacific Northwest. Water quality will not be a limiting factor if the present awareness of the importance of the environment is translated into action to control pollution. Coastal zoning is a threat to aquaculture in some areas but could protect those areas which are most important for production of fish and shellfish.

COM-74-50849-13/GA
(Order as COM-74-50849)
Bureau of Sport Fisheries and Wildlife, Washington, D.C. Div. of Fish Hatcheries.
FRESHWATER FISH CULTURE IN JAPAN,
Harvey Willoughby. Feb 74, 4p NOAA-74080201-13
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p103-105 Feb 74, COM-74-50849.

Descriptors: *Fresh water fishes, *Aquaculture, Salt water, Trout, Salmon, Eels, Commercial fishing, Japan.

Identifiers: Oncorhynchus keta, Oncorhynchus nerka, Salmo gairdneri, Anguilla japonica.

Observations on Japanese Fish Culture were made during field travel in Japan in the period October 20-27, 1971. Information is given on saltwater trout culture, salmon culture, commercial trout farms and eel culture.

COM-74-50849-14/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Oxford, Md. Middle Atlantic Coastal Fisheries Center.
SHELLFISH CULTURE IN JAPAN,
William N. Shaw. Feb 74, 5p NOAA-74080201-14
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p107-110 Feb 74, COM-74-50849.

Descriptors: *Shellfish, *Aquaculture, Mollusca, Oysters, Clams, Snails, Fish harvesting, Statistical data, Japan.
Identifiers: Crassostrea gigas, Patinopecten yessoensis, Haliotis discus.

Japan has long been recognized as a leader in the aquaculture of molluscs. In 1969, approximately 560,000 tons of shellfish were harvested. Principal species under cultivation include Pacific oysters, Crassostrea gigas, scallops, Patinopecten yessoensis, and the abalone, Haliotis discus. Several species of clams and snails also play an important role in the total production figures, but these are mostly caught from wild populations and are not farmed to any extent.

COM-74-50849-15/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Galveston, Tex. Gulf Coastal Fisheries Center.
CRUSTACEAN CULTURE,
Cornelius R. Mock. Feb 74, 4p Contrib-343 NOAA-74080201-15
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p111-113 Feb 74, COM-74-50849.

Descriptors: *Crustacea, *Aquaculture, Shrimps, Crabs, Lobsters, Shellfish, Japan.
Identifiers: Penaeus japonicus, Portunus tribercalatus, Panulirus japonicus, Machrobrachium rosenbergi.

General information is given on crustacean culture in Japan. Special attention is given to the shrimp, Penaeus japonicus; crabs, Portunus triberculatus; freshwater shrimp, Macrobrachium sp.; and the spiny lobster, Panulirus japonicus.

COM-74-50849-16/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Seattle, Wash. Northwest Region.
MARINE FISH CULTURE IN JAPAN,
John B. Glude. Feb 74, 8p NOAA-74080201-16
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p115-121 Feb 74, COM-74-50849.

Descriptors: *Marine fishes, *Aquaculture, Flatfishes, Salmon, Trout, Japan.

A summary of the status of aquaculture of marine fishes in Japan is presented. A number of species of marine or anadromous fish are being cultivated in seawater in Japan on an experimental or commercial basis.

COM-74-50849-17/GA
(Order as COM-74-50849)
National Marine Fisheries Service, Milford, Conn. Milford Lab.
SOME IMPRESSIONS REGARDING GENETICS AND THE FISHERIES OF JAPAN,
A. Crosby Longwell. Feb 74, 12p NOAA-74080201-17
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p123-133 Feb 74, COM-74-50849.

Descriptors: *Fisheries, *Genetics, Aquaculture, Pollution, Biological laboratories, Hybridization, Breeding, Marine biology, Japan.

The report is based on a tour of Japanese laboratories concerned with aquaculture or subjects pertinent to it, 8-13 October 1972; and on attendance at the Second International Ocean Development Conference, Tokyo, Japan, 5-7 October 1972. Following a statement on background information on genetics in Japanese fisheries, information is given on: The expansion of intensive aquaculture; pollution and intensive aquaculture; applied and basic genetic research to support fish breeding; storage of stocks and collections for breeding purposes; the National Institute of Genetics; oysters of Japan, specific use of hybrides and hybrid vigor. Details are given on visits to the various laboratories in Japan.

COM-74-50938/1GA PC-GPO
National Marine Fisheries Service, Seattle, Wash.
ANGLERS' GUIDE TO THE UNITED STATES ATLANTIC COAST. FISH, FISHING GROUNDS AND FISHING FACILITIES. SECTION I. PASSAMAQUODDY BAY, MAINE TO CAPE COD,
Bruce L. Freeman, and Lionel A. Walford. Jul 74, 19p* NOAA-74090601
See also COM-74-50939.
Paper copy available from GPO $4.15 as stock number 0320-00068.

Descriptors: *Fishes, *Fishing grounds, *Atlantic Coast, *Passamaquoddy Bay, *Cape Cod, *Recreation, Ocean environments, Fisheries, Coastal topographic features, Deep water, Shallow water, Classifications, Casco Bay, Isles of Shoals, Scituate Harbor, Round Hill Point, Maps, Dictionaries, Manuals.
Identifiers: *Sport fishing.

The report is the first of an eight part series dealing with fish, fishing grounds and fishing facilities. It is mainly a geographical study of marine recreational fishing. Pertinent information is given on land configuration and water depth, fish and fishing. Sections shown separately are Casco Bay to Isles of Shoals, and from the Isles of Shoals to Scituate Harbor, and from Scituate Harbor to Round Hill Point. In addition to a specialized glossary, a chart of the most commonly caught fishes is included.

COM-74-50939/9GA PC-GPO
National Marine Fisheries Service, Seattle, Wash.
ANGLERS' GUIDE TO THE UNITED STATES ATLANTIC COAST. FISH, FISHING GROUNDS AND FISHING FACILITIES. SECTION II. NANTUCKET SHOALS TO LONG ISLAND SOUND,
Bruce L. Freeman, and Lionel A. Walford. Jul 74, 19p* NOAA-74090602
See also COM-74-50940.
Paper copy available from GPO $4.15.

Descriptors: *Fishes, *Fishing grounds, *Atlantic Coast, *Nantucket Shoals, *Long Island Sound, *Recreation, Ocean environments, Fisheries, Coastal topographic features, Deep water, Shallow water, Classifications, Beavertail Point, Martha's Vineyard Island, Gooseberry Neck, Watch Hill Point, Maps, Dictionaries, Manuals.
Identifiers: *Sport fishing.

The report is the second of an eight part series dealing with fish, fishing grounds and fishing facilities. It is mainly a geographical study of marine recreational fishing. Pertinent information is given on land configuration and water depth, fish and fishing. Sections shown are Nantucket Shoals, Martha's Vineyard to Beavertail Point, Gooseberry Neck to Watch Hill Point, and Long Island Sound. In addition to a specialized glossary, a chart of the most commonly caught fishes is included.

COM-74-50940/7GA PC-GPO
National Marine Fisheries Service, Seattle, Wash.
ANGLERS' GUIDE TO THE UNITED STATES ATLANTIC COAST. FISH, FISHING GROUNDS AND FISHING FACILITIES. SECTION III. BLOCK ISLAND TO CAPE MAY, NEW JERSEY,
Bruce L. Freeman, and Lionel A. Walford. Jul 74, 23p* NOAA-74090603
See also COM-74-50941.
Paper copy available from GPO $4.30 as stock number 0320-00071.

Descriptors: *Fishes, *Fishing grounds, *Atlantic Coast, *Block Island, *Cape May, *Recreation, Ocean environments, Fisheries, Coastal topographic features, Deep water, Shallow water, Classifications, Shinnecock Bay, South Oyster Bay, Lloyd Neck, Beach Haven Inlet, Maps, Dictionaries, Manuals.
Identifiers: *Sport fishing, Ocean City(Maryland), Elberon(New Jersey).

The report is the third of an eight part series dealing with fish, fishing grounds and fishing facilities. It is mainly a geographical study of marine recreational fishing. Pertinent information is given on land configuration and water depth, fish and fishing. Sections shown are Block Island to Shinnecock Bay, Shinnecock Bay to South Oyster Bay, Lloyd Neck to Elberon, Elberon to Beach Haven, Beach Haven Inlet to Cape May, and Cape May to Ocean City, MD. In addition to a specialized glossary, a chart of the most commonly caught fishes is included.

COM-74-50941/5GA PC-GPO
National Marine Fisheries Service, Seattle, Wash.
ANGLERS' GUIDE TO THE UNITED STATES ATLANTIC COAST. FISH, FISHING GROUNDS AND FISHING FACILITIES. SECTION IV. DELAWARE BAY TO FALSE CAPE, VIRGINIA,
Bruce L. Freeman, and Lionel A. Walford. Jul 74, 19p* NOAA-74090604
See also COM-74-50938.
Paper copy available from GPO $4.15 as stock number 0320-0072.

Descriptors: *Fishes, *Fishing grounds, *Atlantic Coast, *Delaware Bay, *False Cape, *Recreation, Ocean environments, Fisheries, Coastal topographic features, Deep water, Ocracoke Island, Quinby Inlet, Cape May, Sinepuxent Bay, Chincoteague Bay, Shallow water, Maps, Fishing equipment, Classifications, Dictionaries, Manuals.
Identifiers: *Sport fishing, Atlantic City(New Jersey).

The report is the fourth of an eight part series dealing with fish, fishing grounds and fishing facilities. It is mainly a geographical study of marine recreational fishing. Pertinent information is given on land configuration and water depth, fish and fishing. Sections shown are Delaware Bay, Cape May to Sinepuxent Bay, Chincoteague Bay to Quinby Inlet, Atlantic City to Ocracoke. In addition to a specialized glossary, a chart of the most commonly caught fishes is included.

N74-30467/6GA PC$5.00/MF$2.25
Linguistic Systems, Inc., Cambridge, Mass.
EVOLUTION OF THE GRAVIRECEPTOR AND ITS INVESTIGATION UNDER CONDITIONS OF ACCELERATION AND WEIGHTLESSNESS.
Y. A. Vinnikov. Jul 74, 38p NASA-TT-F-15574
Contract NASW-2482

Tran-Transl. Into English from Arkh. Anatomii, Gistol. I Embriol. (Ussr), V. 66, No. 1, 1974 p 10-25.

Descriptors: *Gravireceptors, *Invertebrates, *Linear accelerators, *Vertebrates, *Weightlessness, Electron microscopes, Photointerpretation, Soyuz spacecraft.

For abstract, see STAR 1220

PB-234 947/0GA PC$3.75/MF$2.25
Wright State Univ., Dayton, Ohio. Dept. of Biological Sciences.
DEVELOPMENT OF CELL STRAINS FROM HUMAN AND GUINEA PIG LUNG.
Annual rept. Jul 73-Jun 74,
Robert J. Hay. May 74, 43p NIH/NHLI-NO1-HR-3-3016-5/74
Contract NO1-HR-3-3016

Descriptors: *Tissue culture, Culture media, Cultures(Biology), Humans, Guinea pigs, Lung, Trypsin, Tissues(Biology), Enzymes, Peptide hydrolase, Cytology, Digestion(Biology), Epithelium, Viability, Cells(Biology).
Identifiers: Collagenase, *Cell clones.

Conditions for dissociating guinea pig lung tissue with viable cell yields exceeding 90 percent were identified. A mixture of trypsin (1.9 mg/ml and collagenase (2.5 mg/ml) was generally effective. Criteria for judgment included cell viability as well as yield of viable cells per unit weight of tissue. Clonal analyses were performed using Ham's F12 medium supplemented with sera from several differing sources. Fetal serum was most active in stimulating proliferation while horse serum appeared to select for lung epithelial cells. Fibroblast clones were most numerous and three distinct types of epithelial cell clone (E1, E2, and ESS) were recognized. Epithelial cell clones would not be isolated from human lung tissue by standard techniques. It is possible, however, to separate human lung epithelia from fibroblastic cells by a differential adhesion method.

PB-235 609/5GA PC$4.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
WHALES, WHALING, AND WHALE RESEARCH: A SELECTED BIBLIOGRAPHY. SUPPLEMENT NUMBER TWO.
Special literature survey no. 52-2,
L. R. Magnolia. 1 Jul 74, 88p* TRW-99900-7494-TU-04
See also AD-781 173.

Descriptors: *Whales, *Bibliographies, Cetacea, Abstracts, Conservation, Mammals, Assessments, Statistical data, Animal migrations, Management, Abundance, North Atlantic Ocean, North Pacific Ocean, Antarctic regions, Arctic regions, Southern hemisphere.

The bibliography presents an additional compilation of English-language references on the Cetacea, whaling techniques, and research on these mammals, and supplements previous compilations in this series. The majority of the references were published or announced between June, 1973, and May, 1974. Generic and specific names are those used by the authors; review of the names for consistency with recent taxonomic evaluations if left to the users of the bibliography. Author abstracts are presented and are so credited. Ocassionally, the compiler has modified or abridged abstracts; these are indicated as 'Author, modified' or 'Author, abridged.' Abstracts prepared or modified by the staff of 'Government Reports Announcements' (GRA) and published therein are so indicated.

6E. Clinical Medicine

AD-785 620/6GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
BOLIVIAN HEMORRHAGIC FEVER IN RHESUS MONKEYS: TREATMENT WITH SPECIFIC, HOMOLOGOUS ANTIBODY,
Gerald A. Eddy, Michael D. Kastello, Stephen K. Scott, and Timothy G. Terrell. 1974, 11p

Descriptors: *Virus diseases, *Arboviruses, Etiology, Signs and symptoms, Monkeys, Experimental data, Pathology, Histology, Serodiagnosis, Hematology, Immunity, Therapy, Gamma globulin.
Identifiers: *Bolivian hemorrhagic fever, Machupo virus.

Data from Machupo virus infected rhesus monkeys showed that species to be a useful model for Bolivian hemorrhagic fever (BHF) in humans. The clinical signs, hematologic data and histopathologic lesions were generally similar to those seen in humans except that the disease course was more severe and perhaps somewhat briefer in the monkey. Data showed that: relatively low prophylactic doses of specific antibody given at about the time of exposure to BHF prevented the development of clinical signs of disease; BHF, unlike most viral diseases, can be successfully treated, in monkeys at least, if antibody therapy is initiated early after the onset of clinical signs; and the maintenance of detectable levels of passive antibody with daily injections may permit successful treatment as much as four days after the clinical signs have become apparent.

AD-785 673/5GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
TWO PROGNOSTIC INDICES FOR THE TRAUMA PATIENT,
William J. Sacco, Michael A. Goldfarb, Michael A. Weinstein, Terrence F. Ciurej, and R. Adams Cowley. 1974, 12p

Descriptors: *Trauma, *Pattern recognition, Shock(Pathology), Diagnosis(Medicine), Wounds and injuries, Indexes(Ratios), Survival(Personnel), Patients, Respiration, Blood chemistry.

A number of pattern recognition techniques have been used to determine compact physiological and biochemical indices which quantitatively characterized post-traumatic states. These indices frequently characterize the patient more accurately than physicians. The paper reports on two indices. A trauma index (called the CHOP index) based on serum creatinine, hematocrit, serum osmolality, and systolic blood pressure, evolved from a retrospective and then a prospective analysis of over 700 patients. A decision rule which predicts death or survival resulted in a misclassification rate of less than 10% for patients in the Trauma Unit for more than one day. A respiratory index (R.I.) which is the alveolar-arterial oxygen difference divided by the arterial partial pressure of oxygen was investigated in a retrospective study of 177 consecutive intubated patients. All patients with an R.I. of two or greater were intubated. Patients with an R.I. over six had a 12% chance of survival. Prognosis regions are specified in the space determined by the two indices. A nomogram which allows one to follow the course of a patient with respiratory problems is described.

AD-785 720/4GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
HEPATOCELLULAR ULTRASTRUCTURE IN ASYMPTOMATIC HEPATITIS B ANTIGENEMIA.
Technical rept.,
Shih-Chien Sun, Karl E. Anderson, Chi-Pen Hsu, and Shih-Liang Kau. Jun 74, 10p Rept no. NAMRU-2-TR-604
Availability: Pub. in Archives of Pathology, v97 p373-379 Jun 74.

Descriptors: *Liver, *Hepatitis, Pathology, Tissues(Biology), Virus diseases.
Identifiers: Histopathology.

Liver tissue form 21 Chinese military recruits with hepatitis B (HB) antigenemia was examined by electron microscopy. Fine structural abnormalities of the endoplasmic reticulum, mitochondria, and bile canaliculi were frequently present. Nuclear abnormalities were not prominent, and no intranuclear virus-like particles were found. Most striking was a pattern of proliferation of the endoplasmic reticulum associated with intracisternal filaments and particles. The possible relationship of this cytoplasmic alteration to HB virus replication deserves further study. (Author)

AD-785 746/9GA PC$3.25/MF$2.25
Pan American Health Organization Washington D C
PROGRAM FOR PREPARATION OF IMMUNE GLOBULIN AGAINST BOLIVIAN HEMORRHAGIC FEVER.
Final rept. 1 Jul 73-30 Sep 74,
James O. Bond. 30 Sep 74, 8p
Contract DAMD17-74-C-4012

Descriptors: *Virus diseases, *Gamma globulin, *Hemorrhagic fevers, Immunity, Bolivia, Preparation, Prophylaxis, Arboviruses, Dosage.
Identifiers: *Bolivian hemorrhagic fever, Machupo virus.

The project provided 145 ten ml ampoules of gammaglobulin prepared from 222 units of plasma donated by persons known to be immune to Bolivian hemorrhagic fever. Donors were recruited from the rural area of San Joaquin, Bolivia, where a temporary plasmapheresis unit was established, using project funds. The collected plasma was fractionated in the United States where one half was retained for prophylactic or therapeutic use following potential laboratory accidents. The remainder was returned to Bolivia to be used in treatment or prophylaxis of contracts to known cases. (Modified author abstract)

AD-785 804/6GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
EFFECTS OF HYPOXIC STRESS ON SURVIVAL TIMES OF MICE INFECTED WITH EITHER 'STAPHYLOCOCCUS AUREUS' OR 'KLEBSIELLA PNEUMONIAE'.
Technical rept.,
Richard I. Walker, Albert E. New, and Wen-Ching Wang. Jun 74, 13p Rept no. NAMRU-2-TR-610
Availability: Pub. in the Southeast Asian Jnl. of Tropical Medicine and Public Health, v5 n2 p190-196 Jun 74.

Descriptors: *Bacterial diseases, *Hypoxia, Therapy, Infectious diseases, Klebsiella pneumoniae, Staphylococcus aureus, Mice, Experimental data.

Comparative studies of the effect of hypoxic stress on infection with gram positive or gram negative bacteria were conducted. Survival times of mice infected with either S. aureus or K. pneumoniae were significantly extended by treatment with 10% oxygen begun immediately post infection. Delayed treatment was ineffective. Hypoxia induced by 0.6 atm. was detrimental in treatment of infected mice. This latter treatment had no effect on bacterial counts in organs of infected mice. Treatment with 10% oxygen did, however, increase numbers of S. aureus in lungs and livers of infected mice. No effect of this treatment on bacterial counts was seen in mice challenged with K. pneumoniae. Mice with diffuse type haemoglobin were found to be more resistant to both infections than animals with the single type haemoglobin. Thus, under some circumstances, hypoxia can prolong survival times of mice infected with S. aureus or K. pneumoniae, apparently through effects on host metabolism.

AD-785 806/1GA Reprint
Naval Medical Research Unit No. 2, Taipai (Taiwan).

THE NAPU VALLEY, A NEW SCHISTOSOMIASIA AREA IN SULAWESI, INDONESIA.
Technical rept.,
W. Patrick Carney, Sjahrul Masri, Jun 74, 12p
NAMRU-2-TR-611
Availability: Pub. in the Southeast Asian Jnl. of Tropical Medicine and Public Health, v5 n2 p246-251 Jun 74.

Descriptors: *Malaria, *Indonesia, *Schistosomiasis, *Helminthic diseases, *Parasitic diseases, Tropical diseases, Schistosoma, Protozoa, Epidemiology.
Identifiers: Schistosoma japonica, Protozoal diseases.

A survey for intestinal parasites and malaria conducted in the Napu Valley of Central Sulawesi has shown that oriental schistosomiasis is widespread and highly endemic in the populations sampled. Stool specimens were obtained from 583 people and Schistosoma japonicum eggs were detected in 251 cases or 43%. Infections were found in all age groups from 3 to 75 years. Hookworm infections were found in 59% of those examined. Other helminthic and protozoan infections found in relatively low prevalences were: Trichuris trichiura, Enterobius vermicularis, Entamoeba histolytica, Entamoeba hartmanni, Endolimax nana, Iodamoeba butschlii, Giardia lamblia and Chilomastix mesnili. Parasitemias due to Plasmodium falciparum were detected in all but one village sampled.

AD-786 001/8GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
THE USE OF THE ALLERGIC TEST WITH DYSENTERIN FOR THE PURPOSE OF THE EXPOSURE OF PATIENTS WITH DYSENTERY,
I. P. Malorodov. 29 Aug 74, 7p Rept no. FTD-MT-24-1270-74
Edited machine trans. of Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii (USSR) v47 n10 p148 Oct 70, by Charles T. Ostertag, Jr.

Descriptors: *Dysentery, *Gastrointestinal diseases, Immunology, Skin(Anatomy), Infectious diseases, Bacteria, Antigens, Diagnosis(Medicine), USSR, Translations.
Identifiers: *Allergens, *Skin tests.

A dysentery diagnosis was indicated after proctosigmoidoscopy and bacteriological investigations in 25 persons with positive allergic skin tests. The patients were hospitalized in an infectious-disease hospital, where the diagnosis of dysentery was confirmed clinically, and on the basis of supplementary bacteriological investigation of feces, in 3 cases, it was possible to isolate the causative agent of the disease. The intracutaneous test with Tsuverkalov allergen merits implementation in practice.

AD-786 007/5GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
IMMUNITY AND SENSITIZATION TO MICROBE ALLERGENS IN PATIENTS WITH CHRONIC TONSILLITIS,
A. E. Vershigora, E. A. Evdoshchenko, T. I. Begunova, T. E. Mikhailovskaya, and K. N. Lokhvitskaya. 29 Aug 74, 16p Rept no. FTD-MT-24-1209-74
Edited machine trans. of Zhurnal Ushnykh, Nosovykh i Gorlovykj Boleznei (USSR) p46-52 1969, by K. L. Dion.

Descriptors: *Bacterial diseases, *Allergic diseases, Hypersensitivity, Antigens, Immunity, Infectious diseases, Lymphatic system, Bacteria, Streptococcus, USSR, Translations.
Identifiers: *Allergens, *Tonsillitis, Skin tests.

Specific immunity was studied by investigating blood serum titers of antistreptolysin-O, Streptococcus antihyaluronidase, and agglutinin to corpuscular Staphylococcus antigen. In order to determine the level of nonspecific immunity, titers of complement, heterophyllous agglutinin, and lysozyme in the blood serum were determined. Protein fractions in the blood serum were also determined by paper electrophoresis. All of these tests are indicators of the natural resistance of the organism. Allergization was determined on the basis of skin samples with microbe allergens, blood eosinophils and eosinophils from the tissues of removed tonsils, (50 cases), and skin tests with histamine. In addition, the C-reactive protein in the blood serum was investigated in all patients. All these indices were studied by generally-accepted methods.

AD-786 160/2GA Reprint
Armed Forces Inst of Pathology Washington D C
CAFE AU LAIT SPOTS WITHOUT GIANT PIGMENT GRANULES: OCCURRENCE IN SUSPECTED NEUROFIBROMATOSIS,
David N. Silvers, Robert S. Greenwood, and Elson B. Helwig. 19 Mar 74, 3p
Availability: Pub. in Archives of Dermatology, v110 p87-88 Jul 74.

Descriptors: *Skin diseases, *Neoplasms, Pigments, Diagnosis(Medicine), Granules, Pathology, Histology, Tissues(Biology).
Identifiers: VON Recklinghausens disease, *Neurofibromatosis.

Recent reports have suggested that the diagnosis of neurofibromatosis can be made by finding giant pigment granules in dihydroxyphenylalanine-incubated epidermal whole mounts from cafe au lait spots. This study indicates that these 'macromelanosomes' may not be found in the hyperpigmented macules in all cases of neurofibromatosis and that they may be less common in children. Failure to find such granules should not preclude a diagnosis of neurofibromatosis.

AD-786 161/0GA Reprint
Armed Forces Inst of Pathology Washington D C
CALCIFYING EPITHELIAL ODONTOGENIC TUMOR: A SURVEY OF 23 CASES AND DISCUSSION OF HISTOMORPHOLOGIC VARIATIONS,
Sigurds O. Krolls, and Jens J. Pindborg. 10 Apr 74, 6p
Availability: Pub. in Archives of Pathology, v98 p206-210 Sep 74.

Descriptors: *Neoplasms, *Dentistry, Face(Anatomy), Histology, Pathology, Tissues(Biology).
Identifiers: *Maxillary neoplasms, Ameloblastoma, Histopathology, *Oral diseases.

There are 23 acceptable cases of calcifying epithelial odontogenic tumor on file at the Armed Forces Institutes of Pathology. With the addition of these cases, a total of reported cases in the English literature reaches 69 and the previous age range of 16 to 82 years has been extended by the inclusion of an 8-year-old child. The mandible was affected in 78% of the cases, with molar area most frequently involved. Among the variation in histomorphologic features were the amount and type of calcification, the texture of the cytoplasm of the tumor cells, the arrangement of tumor cells, and the amyloid substance within the tumor. (Author)

AD-786 164/4GA Reprint
Armed Forces Inst of Pathology Washington D C
GRANULAR-CELL AMELOBLASTOMA: A SURVEY OF TWENTY CASES FROM THE ARMED FORCES INSTITUTE OF PATHOLOGY,
Kenton S. Hartman. 1974, 16p
Availability: Pub. in Oral Surgery, v38 n2 p241-253 Aug 74.

Descriptors: *Neoplasmas, Face(Anatomy), Radiotherapy, Therapy, Diagnosis(Medicine), Pathology, Tissues(Biology), Histology.
Identifiers: *Ameloblastoma, *Maxillary Neoplasms, Histopathology, Oral diseases.

Twenty cases of granular-cell ameloblastoma of the jaws have been analyzed in an attempt to define further the clinical parameters and biologic behavior of this lesion. Theories of origin of the granular cells have been discussed. Included in this series is the third well-documented case of a malignant granular-cell ameloblastoma to be reported in the literature. The behavior of an individual ameloblastoma cannot be accurately predicted from histologic studies alone, and thus it may be speculative to assume that granular cells have any definite prognostic significance in ameloblastoma. The follow-up in this series suggests, however, that the granular-cell ameloblastoma is an aggressive lesion with a marked proclivity for recurrence unless appropriate surgical measures are instituted at the first operation.

AD-786 165/1GA Reprint
Armed Forces Inst of Pathology Washington D C
HEPATIC INJURY ASSOCIATED WITH PENICILLIN THERAPY,
Leonard I. Goldstein, and Kamal G. Ishak. 16 Mar 74, 5p
Availability: Pub. in Archives of Pathology, v98 p114-117 Aug 74.

Descriptors: *Liver, *Penicillins, Diagnosis(Medicine), Hypersensitivity, Drugs, Antibiotics, Pathology, Tissues(Biology), Histology, Blood chemistry.
Identifiers: *Drug allergies, Histopathology.

The clinical, light microscopical, and ultrastructural findings of a patient who developed a syndrome resembling serum sickness following a course of phenoxymethyl penicillin were studied. Laboratory data included peripheral eosinophillia and increase in the activity of the serum alkaline phosphatase; the latter abnormality was shown to be of hepatic origin. Light microscopy showed minimal intracellular cholestasis and unicellular hepatocytic injury. Ultrastructural findings included changes in canaliculi and related organelles involved in the secretion of bile. (Author)

AD-786 166/9GA Reprint
Armed Forces Inst of Pathology Washington D C
KINEMATICS OF AIRCRAFT OCCUPANTS IN ACCIDENTS: FEASIBILITY OF COMPUTER SIMULATION,
Robert R. McMeekin. 1974, 6p
Availability: Pub. in Aerospace Medicine, v45 n8 p970-974 Aug 74.

Descriptors: *Aviation accidents, *Aviation injuries, Pathology, Wounds and injuries, Computerized simulation, Etiology, Correlation techniques, Aircraft, Restraint.
Identifiers: Design.

The goal of the study is correlation of the occupant's injuries with the events of the crash in such a manner as to determine with reasonable probability the structure, if any, responsible for a particular injury and the range of forces probably sustained by the victim. This will aid determinations by systems analysts of whether use of presently available safety equipment or reasonable extension of the present state of the art of equipment, restraint systems, crew seats, and design and layout of the cockpit could be expected to prevent such injury. Mathematical computer simulation of the aircrash victim's kinematics is being used to estimate accelerations and velocities of the body segments and to determine which portions of the cockpit environment could possibly be contacted.

AD-786 167/7GA Reprint
Armed Forces Inst of Pathology Washington D C
MALIGNANT RETICULOENDOTHELIAL DISEASE INVOLVING THE OVARY AS A PRIMARY MANIFESTATION. A SERIES OF 19

LYMPHOMAS AND 1 GRANULOCYTIC SARCOMA,
I. Chorlton, H. J. Norris, and F. M. King. 30 Oct 73, 12p
Availability: Pub. in Cancer, v34 n2 p397-407 Aug 74.

Descriptors: *Reticuloendothelial system, *Cancer, *Ovaries, *Leukemia, Reproductive system, Neoplasms, Lymphatic system, Diagnosis(Medicine), Pathology, Tissues(Biology), Histology.
Identifiers: *Lymphomas, Histopathology.

Lymphoma and leukemia infiltrates presenting in the ovary as the initial manifestation have been reported only rarely. This study describes the clinical and pathologic findings in 19 patients with unrecognized lymphoma and one patient with an extramedullary neoplasm of poorly differentiated granulocytes (granulocytic sarcoma), all presenting as ovarian tumors. Of the 20 patients, 10 had Stage I lesions and 10 had lesions of Stages II through IV, according to the FIGO staging system for ovarian cancer. Survival varied with the stage, as the median survival for patients with Stage I presentation was 11 months, but only 7 months for patients with neoplasms of Stages II-IV. The poor prognosis for patients with a Stage I presentation (tumor confined to one or both ovaries) contrasts with reports of extranodal lymphoma. The possibility of the existence of a true primary extranodal lymphoma is discussed with reference to a patient with nodular lymphoma surviving 17 years. (Modified author abstract)

AD-786 168/5GA Reprint
Armed Forces Inst of Pathology Washington D C
MYOCARDITIS AND THE AIRCRAFT ACCIDENT,
Irvin M. Sopher. Aug 74, 6p
Availability: Pub. in Aerospace Medicine, v45 n8 p963-967 Aug 74.

Descriptors: *Cardiovascular diseases, *Aviation accidents, Trauma, Aviation medicine, Pilots, Diagnosis(Medicine), Pathology, Tissues(Biology), Histology.
Identifiers: *Myocarditis, Histopathology.

The entity of focal myocarditis is recognized by forensic pathologists as a cause of sudden death among asymptomatic ambulatory persons. This lesion has been noted by other investigators to represent an incidental postmortem finding that exists in at least 5% of the population. A survey of the aircraft accident files has disclosed 12 cases of focal myocal myocarditis as noted in postmortem examinations of military aircrew members dying as a result of air accident trauma. The incidence of the finding in this survey is estimated at 0.8-3.0%. This point is made that the aviation pathologist must not dismiss the potential significance of these foci as a cause of pilot incapacitation, but the relevance of the lesion can only be interpreted in consideration of the total aspects surrounding the accident. (Modified author abstract)

AD-786 169/3GA Reprint
Armed Forces Inst of Pathology Washington D C
PRIMARY LIPOIDAL DEGENERATION OF THE CORNEA,
Ben S. Fine, William M. Townsend, Lorenz E. Zimmerman, and M. H. Lashkari. 1974, 13p
Availability: Pub. in American Jnl. of Ophthalmology, v78 n1 p12-23 Jul 74.

Descriptors: *Cornea, *Lipids, *Ophthalmology, Eye, Tissues(Biology), Pathology, Histology, Biochemistry.
Identifiers: Histopathology.

A corneal button from an eye with presumed primary lipoidal degeneration of the cornea was examined by light and electron microscopy. The findings were compared with an uncomplicated arcus senilis as well as to reported cases with hereditary dystrophy of Schnyder. The histologic findings suggest that some relationship exists between all of these entities.

AD-786 170/1GA Reprint
Armed Forces Inst of Pathology Washington D C
SARCOID GRANULOMAS OF THE OPTIC NERVE AND RETINA. REPORT OF A CASE,
Seymour Brownstein, and Frank S. Jannotta. 1974, 9p
Presented at the Annual Meeting of the Canadian Ophthalmological Society (36th), Toronto, June 1973.
Availability: Pub. in Canadian Jnl. of Ophthalmology, v9 n2 p372-378 Jul 74.

Descriptors: *Optic nerve, *Retina, *Granuloma, *Ophthalmology, Eye, Pathology, Tissues(Biology), Histology, Diagnosis(Medicine), Central nervous system.
Identifiers: *Sarcoidosis, Histopathology.

Sarcoidosis is a systemic disease that commonly involves the eye and its adenexa and less commonly, the central nervous system. The modes of presentation of this disease are multiple, and the diagnosis is frequently not made until the time of histopathologic examination of the involved tissue. This is a report of a case that appeared upon presentation to be an intracranial neoplasm and was not diagnosed as sarcoidosis until autopsy. A 17-year-old Negro youth died in coma six weeks after the onset of a progressive neurologic disorder. At autopsy, he was found to have systemic sarcoidosis, including involvement of the left retina, right optic nerve, brain, and leptomeninges.

AD-786 180/0GA PC$3.25/MF$2.25
Oregon Univ Dental School Portland Biophysics Lab
MILITARY FIELD SYSTEM FOR INTRAORAL FLUOROSCOPY AT LOW LEVEL X-RAY EXPOSURES.
Final rept.,
Bhim Sen Savara, James Wesley Irwin, and William L. Parker. 25 Sep 73, 23p
Contract DADA17-67-C-7168

Descriptors: *Dentistry, *Fluoroscopy, *X rays, Exposure(Physiology), Radiation dosage, Radiology, Military operations.

An intraoral fluoroscopy system has been designed and developed under U.S. Army sponsorship. The system provides real-time and instant replay x-ray images at a radiation exposure on the order of 500 times less than that required for exposure of a dental x-ray film. Radiation reduction is accomplished by use of an electronic image intensifier and a video disk recorder with stop action capability, while the intraoral application is made possible by use of a coherent curved fiber optic bundle with a phosphor on its input face. The system is portable. U.S. Patent No. 3,622,785 for this system was issued in November, 1971. (Author)

AD-786 262/6GA Reprint
Boston Univ Medical Center Mass
IMMUNOCOMPETENT LYMPHOCYTES IN PREVIOUSLY FROZEN WASHED RED CELLS,
James P. Crowley, Eugene M. Skrabut, and C. Robert Valeri. 26 Nov 73, 7p
Contract N00114-70-C-0111
Prepared in cooperation with Naval Blood Research Lab., Chelsea, Mass.
Availability: Pub. in Vox Sanguinis, v26 n6 p513-517 1974.

Descriptors: *Erythrocytes, *Lymphocytes, *Immunology, *Blood transfusion, Leukocytes, Blood preservation, Purification.
Identifiers: Graft versus host disease.

Most of the leukocytes were removed from red cells during glycerolization, frozen storage at -80C, and washing. Residual lymphocytes that were isolated from the washed red cells were found to be responsive to phytohemagglutinin stimulation. Since phytohemagglutinin-responsive lymphocytes appear to mediate the graft-versus-host reaction, it is imperative that freeze-preserved red cells be handled with the same precautions as other blood products before transfusion to patients with immuno=logic deficiencies. (Author)

CONF-740708-10 PC$4.00/MF$2.25
Florida Univ., Gainesville; Veterans Administration Hospital, Gainesville, Fla.
CLINICAL APPLICATION OF CEREBRAL DYNAMIC PERFUSION STUDIES.
F. H. DeLand. 1971, 18p SM-185/40
U.S. Sales Only.

Descriptors: (*Brain, *Scintiscanning), (*Malformations, *Diagnosis), (*Neoplasms, Diagnosis), (*Arteriosclerosis, Diagnosis), Blood vessels, Computer calculations, Data processing, Gamma cameras, Injuries, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics, Radiopharmaceuticals, Wounds.

For abstract, see NSA 30 08, number 21448.

CONF-740708-11 PC$4.00/MF$2.25
Rigshospitalet, Copenhagen (Denmark).
COMPARISON OF IODIDE AND PERTECHNETATE TRAPPING AND LOSS IN THE HUMAN THYROID GLAND.
H. Dige-Petersen. 1973, 11p SM-185/58
U.S. Sales Only.

Descriptors: (*Hyperthyroidism, *Diagnosis), (*Hypothyroidism, Diagnosis), (*Iodine 132, *Uptake), (*Technetium 99, Uptake), Isomeric nuclei, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Radionuclide kinetics, Scintiscanning, Thyroid.

For abstract, see NSA 30 08, number 21415.

CONF-740708-12 PC$4.00/MF$2.25
Alabama Univ., Birmingham.
DYNAMIC RENAL STUDIES IN THE EARLY POST-TRANSPLANT PERIOD.
E. V. Dubovsky, J. R. Logic, W. N. Tauxe, A. G. Diethelm, and W. A. Sterling. 1974, 8p SM-185/49
U.S. Sales Only.

Descriptors: (*Kidneys, *Scintiscanning), (*Transplants, *Graft-host reaction), Blood, Diagnostic techniques, Dtpa, Hippuran, Iodine 131, Isomeric nuclei, Nuclear medicine, Patients, Radiometric analysis, Radionuclide administration, Sampling, Technetium 99, Tracer techniques, Urine.

For abstract, see NSA 30 08, number 21449.

CONF-740708-13 PC$4.00/MF$2.25
Minnesota Univ., Minneapolis Hospitals.
SHUNT DETECTION BY MEANS OF A GAMMA CAMERA AND COMPUTER.
M. E. Goldberg, W. A. Neal, M. K. Loken, J. H. Moller, and R. A. Ponto. 1974, 4p SM-185/93
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Blood flow), (*Lungs, Blood flow), Computer calculations, Data processing, Gamma cameras, Isomeric nuclei, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Scintiscanning, Technetium 99.

For abstract, see NSA 30 08, number 21450.

CONF-740708-14 PC$4.00/MF$2.25
Katholieke Universiteit Nijmegen (Netherlands).
DYNAMIC EVALUATION OF PERIPHERAL MUSCLE PERFUSION FOLLOWING VASCULAR SURGERY.
H. A. Gerritsen, I. Kazem, A. Hasman, and P. J. Kuypers. 1972, 9p SM-185/53

U.S. Sales Only.

Descriptors: (*Legs, *Blood circulation), (*Cardiovascular diseases, *Diagnosis), Intravenous injection, Isomeric nuclei, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Radionuclide kinetics, Scintiscanning, Surgery, Technetium 99, Time dependence, Veins.

For abstract, see NSA 30 08, number 21451.

CONF-740708-15 PC$4.00/MF$2.25
Pisa Univ. (Italy).
EXTRAVASCULAR LUNG WATER: ITS MEASUREMENT BY SIMULTANEOUS PULMONARY AND AORTIC SAMPLING AND ITERATIVE CONVOLUTION.
C. Giuntini, and F. Fazio. 1973, 17p SM-185/82
U.S. Sales Only.

Descriptors: (*Respiratory system diseases, *Diagnosis), (*Body fluids, *Tissue distribution), Albumins, Aorta, Arteries, Blood, Double labelling, Edema, Heavy water, Intravenous injection, Iodine 131, Isotope dilution, Labelled compounds, Lungs, Patients, Radiometric analysis, Radionuclide administration, Sampling, Tracer techniques, Tritium compounds, Water.

For abstract, see NSA 30 08, number 21452.

CONF-740708-17 PC$4.00/MF$2.25
Franklin McLean Memorial Research Inst., Chicago, Ill.; Chicago Univ., Ill.
PRODUCTION AND USE OF EXP 81 RB--/SUP 81M/KR FOR CLINICAL TISSUE PERFUSION MEASUREMENTS WITH THE ANGER CAMERA.
P. V. Harper, B. Rich, K. A. Lathrop, and B. Mock. 1973, 17p SM-185/14
U.S. Sales Only.

Descriptors: (*Rubidium 81, *Tissue distribution), (*Krypton 81, Tissue distribution), (*Body fluids, Tissue distribution), Blood flow, Data processing, Diagnostic techniques, Gamma cameras, Heart, Intravenous injection, Isomeric nuclei, Isotope dilution, Lungs, Nuclear medicine, Patients, Radionuclide administration, Scintiscanning, Cyclotrons, Daughter products, Decay, Gamma spectra, Impurities, Isotope production, Radiopharmaceuticals.

For abstract, see NSA 30 08, number 21453.

CONF-740708-18 PC$4.00/MF$2.25
Western Regional Hospital Board, Glasgow (UK). Dept. of Clinical Physics and Bio-Engineering.
MEASUREMENT OF RED CELL LIFESPAN BY APPLICATION OF THE OCCUPANCY PRINCIPLE.
P. W. Horton, A. W. Hutcheon, and J. H. Dagg. 1974, 7p SM-185/64
U.S. Sales Only.

Descriptors: (*Anemias, *Diagnosis), (*Erythrocytes, *Life span), Biochemical reaction kinetics, Blood plasma, Chromium 51, Erythropoiesis, Intravenous injection, Iron, Iron 59, Medicine, Metabolism, Patients, Radionuclide administration, Sampling, Tracer techniques.

For abstract, see NSA 30 08, number 21454.

CONF-740708-19 PC$4.00/MF$2.25
Virginia Univ., Charlottesville.
XENON VENTILATION AND PERFUSION STUDIES.
B. Y. Howard. 1973, 13p SM-185/18
U.S. Sales Only.

Descriptors: (*Lungs, *Scintiscanning), (*Xenon 133, *Lung clearance), Blood flow, Computer calculations, Data processing, Diagnostic techniques, Nuclear medicine, Patients, Physiology, Radionuclide administration, Respiration.

For abstract, see NSA 30 08, number 21455.

CONF-740708-2 PC$4.25/MF$2.25
Massachusetts General Hospital, Boston Physics Research Lab.
DYNAMIC STUDIES WITH A MULTIPROGRAMMED COMPUTER SYSTEM.
N. M. Alpert, B. Jr. Hoop, D. A. Chesler, J. E. Correll, and T. Jones. 1974, 21p SM-185/50
U.S. Sales Only.

Descriptors: (*Brain, *Scintiscanning), Blood flow, Computer calculations, Computer codes, Data processing, Diagnostic techniques, Gamma cameras, Isomeric nuclei, Myocardium, N codes, Nitrogen 13, Nuclear medicine, Oxidation, Oxygen 15, Patients, Physiology, Positron cameras, Radionuclide administration, Radionuclide kinetics, Technetium 99, Tissues.

For abstract, see NSA 30 08, number 21442.

CONF-740708-24 PC$4.00/MF$2.25
Colorado Univ., Denver Medical Center; Franklin McLean Memorial Research Inst., Chicago, Ill.
QUANTIFICATION OF CARDIAC VALVULAR REGURGITATION.
D. L. Kirch, P. P. Steele, C. E. Metz, and D. W. Brown. 1973, 19p SM-185/26
U.S. Sales Only.

Descriptors: (*Heart, *Blood flow), (*Cardiovascular diseases, *Diagnosis), Cardiography, Isomeric nuclei, Nuclear medicine, Patients, Pertechnetates, Physiology, Radionuclide administration, Scintiscanning, Technetium 99.

For abstract, see NSA 30 08, number 21456.

CONF-740708-25 PC$4.00/MF$2.25
Goettingen Univ. (F.R. Germany).
NON-INVASIVE DETERMINATION OF VOLUME EQUIVALENT CURVES OF THE LEFT VENTRICLE.
H. Luig, D. Emrich, H. P. Breuel, B. E. Strauer, and J. Neubaur. 1973, 8p SM-185/56
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Blood flow), Albumins, Cardiography, Isomeric nuclei, Labelled compounds, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics, Scintiscanning, Technetium 99.

For abstract, see NSA 30 08, number 21457.

CONF-740708-26 PC$4.00/MF$2.25
Harvard Medical School, Boston, Mass.
LOCALIZATION OF LEFT-TO-RIGHT SHUNTS BY RADIONUCLIDE ANGIOCARDIOGRAPHY (RAC).
G. McIlmoyle, D. Ahnberg, G. LaFarge, and S. Treves. 1974, 9p SM-185/81
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Scintiscanning), Blood flow, Blood vessels, Cardiography, Computer calculations, Data processing, Isomeric nuclei, Malformations, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Technetium 99.

For abstract, see NSA 30 08, number 21458.

CONF-740708-28 PC$4.00/MF$2.25
Hopital Saint-Eloi, 34 - Montpellier (France).
ITERATIVE STUDY OF RENAL FUNCTIONS BY THE CONTINUOUS PERFUSION OF RADIOACTIVE TRACERS BEFORE AND AFTER THE INITIATION OF TREATMENT FOR SUGAR DIABETES AND HYPERTENSION.
J. Mirouze, L. Monnier, and C. Olivier. 1974, 5p SM-185/89
In French. U.S. Sales Only.

Descriptors: (*Drugs, *Biological effects), (*Kidneys, *Physiology), (*Hypertension, *Therapy), (*Diabetes mellitus, Therapy), Arteries, Blood, Blood plasma, Diagnostic techniques, Double labelling, Infusion, Iodine compounds, Iodine 125, Iodine 131, Labelled compounds, Patients, Radioactivity, Radiometric analysis, Radionuclide administration, Radionuclide kinetics, Renal clearance, Sampling, Time dependence, Tracer techniques, Urine.

For abstract, see NSA 30 08, number 21460.

CONF-740708-29 PC$4.00/MF$2.25
Rigshospitalet, Copenhagen (Denmark).
PULMONARY FUNCTION STUDIES WITH RADIOISOTOPES.
T. Munkner. 1974, 12p SM-185/104
U.S. Sales Only.

Descriptors: (*Respiratory system diseases, *Diagnosis), (*Lungs, *Blood flow), Albumins, Iodine 131, Labelled compounds, Microspheres, Nuclear medicine, Patients, Physiology, Radionuclide administration, Respiration, Scintiscanning, Xenon 133.

For abstract, see NSA 30 08, number 21461.

CONF-740708-3 PC$4.00/MF$2.25
Miami Univ., Fla. School of Medicine.
DYNAMIC STUDIES OF THYROID FUNCTION USING PARENTERAL NAI-123.
F. S. Ashkar, J. E. Beaver, and H. B. Hupf. 1970, 6p SM-185/79
U.S. Sales Only.

Descriptors: (*Iodine 123, *Tissue distribution), (*Thyroid, *Radionuclide kinetics), Diagnostic techniques, Gamma cameras, Labelled compounds, Nuclear medicine, Patients, Physiology, Radionuclide administration, Scintiscanning, Sodium iodides.

For abstract, see NSA 30 08, number 21443.

CONF-740708-30 PC$4.00/MF$2.25
Mayo Clinic, Rochester, Minn.
ESTIMATION OF EFFECTIVE RENAL PLASMA FLOW IN CHILDREN BY MEANS OF A SINGLE INJECTION SINGLE SAMPLE TECHNIQUE.
W. N. Tauxe, W. Hagge, and G. B. Stickler. 1971, 7p SM-185/48
U.S. Sales Only.

Descriptors: (*Urogenital system diseases, *Diagnosis), (*Children, Urogenital system diseases), Blood plasma, Hippuran, Iodine 131, Kidneys, Medicine, Patients, Pediatrics, Physiology, Radiometric analysis, Radionuclide administration, Sampling, Tracer techniques.

For abstract, see NSA 30 08, number 21462.

CONF-740708-31 PC$4.00/MF$2.25
Johns Hopkins Medical Institutions, Baltimore, Md.
FUNCTIONAL IMAGES OF THE LUNGS.
T. K. Natarajan, and H. N. Jr. Wagner. 1974, 5p SM-185/15
U.S. Sales Only.

Descriptors: (*Xenon 133, *Lung clearance), (*Lungs, *Scintiscanning), (*Microspheres, Lung clearance), Albumins, Blood flow, Diagnostic techniques, Isomeric nuclei, Labelled compounds, Nuclear medicine, Patients, Physiology, Radionuclide administration, Radionuclide kinetics, Respiration, Technetium 99.

For abstract, see NSA 30 08, number 21463.

CONF-740708-32 PC$4.00/MF$2.25
Saint Bartholomew's Hospital, London (UK).

STUDY OF THE POST-EQUILIBRIUM SLOPE APPROXIMATION IN THE CALCULATION OF GLOMERULAR FILTRATION RATE USING THE EXP 51 CR-EDTA SINGLE INJECTION TECHNIQUE.
C. C. Nimmon, J. M. McAlister, B. Hickson, and W. R. Cattell. 1972, 7p SM-185/11
U.S. Sales Only.

Descriptors: (*Kidneys, *Scintiscanning), (*Chromium 51, *Renal clearance), (*Edta, Renal clearance), Blood, Diagnostic techniques, Labelled compounds, Nuclear medicine, Patients, Physiology, Radiometric analysis, Radionuclide administration, Radionuclide kinetics, Sampling.

For abstract, see NSA 30 08, number 21464.

CONF-740708-33 PC$4.00/MF$2.25
Northwestern Univ., Chicago, Ill.
MULTILATERAL EVALUATION OF RENAL TRANSPLANTS WITH RADIONUCLIDES.
D. G. Pavel, B. D. Kahan, J. L. III Quinn, J. J. Bergan, and B. R. Westerman. 1974, 14p SM-185/29
U.S. Sales Only.

Descriptors: (*Kidneys, *Scintiscanning), Diagnostic techniques, Double labelling, Graft-host reaction, Hippuran, Immune reactions, Iodine 131, Isomeric nuclei, Nuclear medicine, Patients, Physiology, Radionuclide administration, Radionuclide kinetics, Technetium 99, Transplants.

For abstract, see NSA 30 08, number 21465.

CONF-740708-35 PC$4.00/MF$2.25
Duke Univ., Durham, N.C. Medical Center.
DATA PROCESSING OF RADIONUCLIDE CEREBRAL ANGIOGRAMS IN THE DIFFERENTIAL DIAGNOSIS OF INTRACRANIAL DISEASE.
R. S. Preissig, L. R. Witherspoon, J. W. Tyson, C. C. Harris, and J. K. Goodrich. 1974, 12p SM-185/37
U.S. Sales Only.

Descriptors: (*Brain, *Scintiscanning), (*Cardiovascular diseases, *Diagnosis), (*Neoplasms, Diagnosis), Arteries, Blood flow, Data processing, Diagnostic techniques, Gamma cameras, Isomeric nuclei, Malformations, Nervous system, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Radionuclide kinetics, Technetium 99, Tissue distribution, Veins.

For abstract, see NSA 30 08, number 21466.

CONF-740708-36 PC$4.25/MF$2.25
Bhabha Atomic Research Centre, Bombay (India). Radiation Medicine Centre.
DYNAMIC STUDIES OF LIVER AND THYROID FUNCTION WITH THE AID OF A GAMMA CAMERA AND AN ON-LINE DIGITAL COMPUTER.
U. R. Raikar, R. D. Ganatra, A. M. Samuel, P. Ramanathan, and S. H. Atmaram. 1974, 25p SM-185/78
U.S. Sales Only.

Descriptors: (*Thyroid, *Scintiscanning), (*Liver, Scintiscanning), Abscesses, Blood flow, Diagnostic techniques, Injection, Isomeric nuclei, Labelled compounds, Neoplasms, Patients, Pertechnetates, Physiology, Phytic acid, Radiocolloids, Radionuclide administration, Radionuclide kinetics, Salts, Sulfur compounds, Technetium 99, Tissue distribution, Tracer techniques.

For abstract, see NSA 30 08, number 21467.

CONF-740708-38 PC$4.00/MF$2.25
Helsinki Univ. Central Hospital (Finland). Meilahti Clinic.
MODEL FOR THE ANALYSIS OF RADIOCARDIOGRAMS USING A DIGITAL COMPUTER IN TIME-SHARING MODE.
E. Riihimaeki, A. Heiskanen, T. Heiskanen, and E. Taehti. 1974, 7p SM-185/75
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Scintiscanning), Biological models, Blood flow, Cardiography, Computer calculations, Data processing, Gamma cameras, Indium 113, Isomeric nuclei, Mathematical models, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics.

For abstract, see NSA 30 08, number 21469.

CONF-740708-40 PC$4.00/MF$2.25
Institute of Medical and Veterinary Science, Adelaide (Australia). Div. of Nuclear Medicine.
COMPUTER ANALYSIS OF REGIONAL CEREBRAL PERFUSION: A CRITICAL CLINICAL ANALYSIS.
P. M. Ronai, R. J. O'Reilly, and P. J. Collins. 1974, 16p SM-185/9
U.S. Sales Only.

Descriptors: (*Brain, *Blood flow), Computer calculations, Computer codes, Data processing, Diagnostic techniques, Gamma cameras, Isomeric nuclei, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Radionuclide kinetics, Scintiscanning, Technetium 99.

For abstract, see NSA 30 08, number 21470.

CONF-740708-42 PC$4.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Medizin.
RADIOCARDIOGRAPHY OF MINIMAL TRANSIT TIMES: A USEFUL DIAGNOSTIC PROCEDURE.
H. Schicha, K. Vyska, V. Becker, and L. E. Feinendegen. 1974, 11p SM-185/54
U.S. Sales Only.

Descriptors: (*Heart, *Scintiscanning), (*Cardiovascular diseases, *Diagnosis), Blood flow, Cardiography, Dtpa, Gamma cameras, Indium 113, Injection, Isomeric nuclei, Labelled compounds, Myocardium, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics.

For abstract, see NSA 30 08, number 21471.

CONF-740708-44 PC$4.00/MF$2.25
California Univ., San Francisco Dept. of Radiology.
DETECTION OF RENAL ARTERY STENOSIS IN HYPERTENSIVE PATIENTS USING THE SCINTILLATION CAMERA AND SMALL COMPUTER.
D. M. Shames, R. E. L. Farmer, and F. D. Rollo. 1974, 11p SM-185/51
U.S. Sales Only.

Descriptors: (*Hypertension, *Diagnosis), (*Kidneys, *Scintiscanning), Arteries, Blood flow, Data processing, Glucose, Isomeric nuclei, Labelled compounds, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics, Technetium 99.

For abstract, see NSA 30 08, number 21472.

CONF-740708-45 PC$4.00/MF$2.25
Texas Univ., Dallas.
REGIONAL MYOCARDIAL PERFUSION STUDIES: A CRITIQUE OF DATA COLLECTION AND PROCESSING TECHNIQUES.
E. M. Stokely, R. W. Parkey, and F. J. Bonte. 1974, 15p SM-185/36
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Scintiscanning), Blood flow, Dogs, Errors, Myocardium, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics, Testing, Xenon 133.

For abstract, see NSA 30 08, number 21473.

CONF-740708-47 PC$4.00/MF$2.25
Helsinki Univ. Central Hospital (Finland). Meilahti Clinic.
TIME-ACTIVITY CURVE ANALYSIS FOR DYNAMIC LUNG STUDY.
E. Taehti, E. Riihimaeki, S. Aaltonen, and O. Korhola. 1974, 9p SM-185/74
U.S. Sales Only.

Descriptors: (*Respiratory system diseases, *Diagnosis), (*Cardiovascular diseases, Diagnosis), (*Lungs, *Scintiscanning), Blood flow, Computers, Data processing, Inhalation, Intravenous injection, Nuclear medicine, Patients, Radionuclide administration, Respiration, Xenon 133.

For abstract, see NSA 30 08, number 21474.

CONF-740708-49 PC$4.25/MF$2.25
California Univ., Los Angeles.
METABOLISM OF EXP 111 IN-TRANSFERRIN AS A MEASURE OF BONE MARROW ACTIVITY.
J. J. Touya, O. E. Anselmi, R. F. Riley, and L. R. Bennett. 1974, 24p SM-185/20
Contract AT(04-1)-GEN-12
U.S. Sales Only.

Descriptors: (*Bone marrow, *Scintiscanning), (*Hemic diseases, *Diagnosis), Comparative evaluations, Indium 111, Intestinal absorption, Iron 59, Labelled compounds, Metabolism, Patients, Radionuclide administration, Rats, Testing, Tissue distribution, Tracer techniques, Transferrin.

For abstract, see NSA 30 08, number 21475.

CONF-740708-5 PC$4.00/MF$2.25
University of Southern California, Los Angeles Dept. of Medicine.
COINCIDENCE COUNTING OF RADIOACTIVE SODIUM IN VIVO.
F. K. Bauer, N. Telfer, and Q. Merrill. 1968, 12p SM-185/21
U.S. Sales Only.

Descriptors: (*Metabolic diseases, *Diagnosis), (*Sodium 22, *Tissue distribution), (*Electrolytes, Tissue distribution), (*Cartilage, *Scintiscanning), Abundance, Auditory organs, Body fluids, Coincidence methods, Intravenous injection, Measuring methods, Nuclear medicine, Patients, Positron cameras.

For abstract, see NSA 30 08, number 21444.

CONF-740708-53 PC$4.25/MF$2.25
Brookhaven National Lab., Upton, N.Y.
EXP 123 I-INDOCYANINE GREEN (EXP 123 I-ICG) AS AN AGENT FOR DYNAMIC STUDIES OF THE HEPATO BILIARY SYSTEM.
A. N. Ansari, H. L. Atkins, R. M. Lambrecht, C. S. Redvanly, and A. P. Wolf. 1974, 21p SM-185/61

Descriptors: (*Biliary tract, *Scintiscanning), (*Liver, Scintiscanning), (*Digestive system diseases, *Diagnosis), Computer calculations, Data processing, Dogs, Dyes, Iodine 123, Labelled compounds, Mice, Nuclear medicine, Physiology, Rabbits, Radionuclide administration, Radionuclide kinetics, Radiopharmaceuticals, Testing.

For abstract, see NSA 30 08, number 21476.

CONF-740708-54 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
CONTINUOUS REGISTRATION OF THE THYROIDAL UPTAKE OF /SUP 99M/TC AND EXP 123 I IN THE FIRST 30 MINUTES.
H. L. Atkins, R. M. Lambrecht, A. N. Ansari, P. R. Bradley-Moore, and A. P. Wolf. 1973, 19p SM-185/46

Descriptors: (*Hyperthyroidism, *Diagnosis), (*Technetium 99, *Uptake), (*Iodine 123, Uptake), (*Thyroid, *Radionuclide kinetics), Comparative evaluations, Isomeric nuclei, Nuclear medicine, Patients, Pertechnetates, Radionuclide administration, Scintiscanning, Sodium iodides.

For abstract, see NSA 30 08, number 21477.

CONF-740708-55 PC$4.00/MF$2.25
Comision Nacional de Energia Atomica, Buenos Aires (Argentina).
DETERMINATION OF CORONARY BLOOD FLOW WITH EXP 84 RB AND POSITRON CAMERA.
A. Chwojnik, S. Fedchteyn, H. Garcia del Rio, V. Pecorini, and C. Giuntini. 7p SM-185/1
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Myocardium, *Blood flow), (*Heart, *Scintiscanning), Nuclear medicine, Patients, Positron cameras, Radionuclide administration, Radionuclide kinetics, Rubidium 84.

For abstract, see NSA 30 08, number 21478.

CONF-740708-59 PC$4.00/MF$2.25
Vanderbilt Univ., Nashville, Tenn. Div. of Nuclear Medicine and Biophysics.
DATA HANDLING SYSTEMS FOR USE IN DYNAMIC FUNCTION STUDIES.
A. B. Brill. 1974, 8p SM-185/101
U.S. Sales Only.

Descriptors: (*Organs, Scintiscanning), (*Scintiscanning, *Data processing), Computer calculations, Computer codes, Data acquisition systems, Diagnostic techniques, Display devices, Nuclear medicine, Patients, Physiology, Programming languages, Radionuclide administration, Radionuclide kinetics.

For abstract, see NSA 30 08, number 21481.

CONF-740708-6 PC$4.00/MF$2.25
Marburg Univ. (F.R. Germany).
STEADY STATE: A STANDARD CONDITION NEGLECTABLE OR COMPULSARY FOR RENAL FUNCTION STUDIES.
W. Bongartz, H. Kuni, H. W. Ridder, and K. Naber. 1972, 18p SM-185/55
U.S. Sales Only.

Descriptors: (*Urogenital system diseases, *Diagnosis), Biological models, Chromium 51, Edta, Kidneys, Labelled compounds, Nuclear medicine, Pathological changes, Patients, Radionuclide administration, Radionuclide kinetics, Renal clearance, Tissue distribution, Whole-body counting.

For abstract, see NSA 30 08, number 21445.

CONF-740708-60 PC$4.00/MF$2.25
Pisa Univ. (Italy).
CARDIAC FUNCTION STUDIES WITH RADIOISOTOPES.
C. Giuntini. 1973, 18p SM-185/103
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Blood flow), Counting techniques, Gamma cameras, Measuring methods, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics, Scintiscanning.

For abstract, see NSA 30 08, number 21482.

CONF-740708-62 PC$4.00/MF$2.25
Harvard Medical School, Boston, Mass.; Peter Bent Brigham Hospital, Boston, Mass.
REGIONAL BLOOD FLOW STUDIES WITH RADIOISOTOPES.
B. L. Holman, B. J. McNeil, and S. J. Adelstein. 1974, 19p SM-185/102
U.S. Sales Only.

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Brain, *Blood flow), (*Kidneys, Blood flow), (*Heart, Blood flow), Computer calculations, Data processing, Nuclear medicine, Organs, Patients, Physiology, Radionuclide administration, Radionuclide kinetics, Scintiscanning.

For abstract, see NSA 30 08, number 21483.

CONF-740708-63 PC$4.00/MF$2.25
Helsinki Univ. Central Hospital (Finland). Meilahti Clinic.
NUMERICAL ANALYSIS OF DATA IN DYNAMIC FUNCTION STUDIES.
E. Riihimaki. 1974, 11p SM-185/100
U.S. Sales Only.

Descriptors: (*Scintiscanning, *Data processing), Computer calculations, Diagnostic techniques, Mathematical models, Nuclear medicine, Organs, Patients, Physiology, Radionuclide administration, Radionuclide kinetics.

For abstract, see NSA 30 08, number 21484.

CONF-740708-64 PC$4.00/MF$2.25
Hopital Necker-Enfants-Malades, 75 - Paris (France); Hopital Laennec, 75 - Paris (France). Clinique de Pneumo-Phtisiologie.
CONTINUOUS MEASUREMENTS, BY TWO ISOTOPES, OF EXTRAVASCULAR LUNG WATER: USE OF A NEW METHOD IN THE ANALYSIS OF PULMONARY CAPILLARY RECRUITMENT AND FILTRATION IN NORMAL MAN.
F. Ruff, P. Even, P. Duroux, I. Caubarrere, and P. de Vernejoul. 1972, 16p SM-185/90
In French. U.S. Sales Only.

Descriptors: (*Respiratory system diseases, *Diagnosis), (*Edema, Diagnosis), (*Lungs, *Scintiscanning), Body fluids, Double labelling, Isotope dilution, Nuclear medicine, Radionuclide administration, Radionuclide kinetics, Tissue distribution.

For abstract, see NSA 30 08, number 21485.

CONF-740708-7 PC$4.25/MF$2.25
Middlesex Hospital, London (UK). Inst. of Nuclear Medicine.
RENAL FUNCTION STUDIES WITH RADIOISOTOPES: AN APPRAISAL.
K. E. Britton. 1974, 22p SM-185/65
U.S. Sales Only.

Descriptors: (*Kidneys, *Scintiscanning), (*Urogenital system diseases, *Diagnosis), Comparative evaluations, Hypertension, Nephritis, Nephrosclerosis, Nuclear medicine, Patients, Physiology, Radionuclide administration, Radiopharmaceuticals, Reviews, Transplants, Uremia, Vascular diseases.

For abstract, see NSA 30 08, number 21446.

CONF-740708-9 PC$4.00/MF$2.25
Technische Univ. Muenchen (F.R. Germany). Nuklearmedizinische Klinik und Poliklinik.
QUANTITATIVE ANALYSIS OF HEPATOGRAMS USING THE GAMMA-CAMERA AND LABELED CONTRAST-MEDIUMS.
G. Buttermann, I. Wolf, H. W. Pabst, G. Hoer, and P. E. Schulze. 1974, 10p SM-185/5
U.S. Sales Only.

Descriptors: (*Liver, *Scintiscanning), (*Biliary tract, Scintiscanning), (*Digestive system diseases, *Diagnosis), Biological models, Computer calculations, Contrast media, Data processing, Gamma cameras, Iodine 131, Labelled compounds, Nuclear medicine, Patients, Radionuclide administration, Radionuclide kinetics.

For abstract, see NSA 30 08, number 21447.

LBL-2491 PC$4.25/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
ANALOG AND DIGITAL SIMULATION OF THE RADOCARDIOGRAM.
H. G. Parker, D. C. Van Dyke, F. T. Upham, and A. A. Windsor. Jun 74, 23p CONF-740708-57, SM-185/23
Contract W-7405-eng-48

Descriptors: (*Cardiovascular diseases, *Diagnosis), (*Heart, *Blood flow), (*Lungs, Blood flow), Analog systems, Biological models, Cardiography, Computer calculations, Data processing, Digital systems, Gamma cameras, Mathematical models, Nuclear medicine, Patients, Radionuclide administration, Scintiscanning.

For abstract, see NSA 30 08, number 21487.

N74-29441/4GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 128, MAY 1974.
May 74, 85p NASA-SP-7011(128)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Exobiology, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 1219

N74-29442/2GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 129, JUNE 1974.
Jun 74, 86p NASA-SP-7011(129)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Exobiology, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 1219

N74-29443/0GA PC$11.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CUMULATIVE INDEX TO THE CONTINUING BIBLIOGRAPHY OF THE 1973 ISSUES.
Jan 74, 590p NASA-SP-7011(124)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Exobiology, Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 1219

N74-30458/5GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES, SUPPLEMENT 130, JULY 1974.
Jul 74, 87p NASA-SP-7011(130)

Descriptors: *Aerospace medicine, *Bibliographies, *Biological effects, *Exobiology,

Aerospace environments, Manned space flight, Physiological effects, Psychological effects.

For abstract, see STAR 1220

N74-30466/8GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
STUDY OF ANTINUCLEAR ANTIBODIES IN SUBJECTS WITH PHOTODERMATITIS.
F. Ippolito, and P. G. Natali. Aug 74, 5p NASA-TT-F-15844
Contract NASW-2481
Tran-Transl. Into English from G. Ital. Dermatol. (Italy), V. 109, No. 2, 1974 p 124-125.

Descriptors: *Antibodies, *Nucleic acids, *Ultraviolet radiation, Antiserums, Deoxyribonucleic acid, Dermatitis.

For abstract, see STAR 1220

PB-235 027/0GA PC$3.75/MF$2.25
Human Resources Research Organization, Alexandria, Va.
DEVELOPMENT AND EVALUATION OF SELF-APPLIED PLAQUE INDICES FOR CHILDREN.
Consulting rept.,
Harold G. Hunter, and C. Dennis Fink. Jul 73, 44p
Contract PHS-72-4273

Descriptors: *Dentistry, Children, Evaluation, Development, Dental caries, Teeth, Hygiene, Human performance, Evaluation, Bacteria.
Identifiers: *Dental plaque, *Preventive dentistry, Indicating systems.

An aim of preventive dentistry is to convince individuals to remove accumulated plaque from their teeth daily by toothbrushing and flossing. This contract attempted to develop a self-administered feedback measure to permit them to judge their own performance. Specifically, it set out to develop a self-applied measure or index of bacterial infection (plaque) for use by persons aged 10 and above. This plaque index should be learned in less than 10 minutes and applied in less than one minute, use materials that are cheap and easily available and correlate well with scores taken by peers and dental professionals using the same system to score the same mouth. Two scoring systems were devised for experimental evaluation: The count method and the rating method. Both require that the teeth be stained. Under the count method, the individual is asked to count the number of teeth showing any stain. Under the rating method, the child is asked to pick one of five color photographs of teeth showing varying degrees of stained plaque.

PB-235 244/1GA PC$3.75/MF$2.25
Esso Research and Engineering Co., Linden, N.J. Government Research Lab.
LIQUID MEMBRANE CAPSULE SYSTEM FOR THE TREATMENT OF CHRONIC UREMIA.
Annual rept. 28 Jun 73-28 Feb 74,
William J. Asher, Kenneth C. Bovee, Robert W. Hamilton, and Philip G. Holtzapple. 10 May 74, 48p GRU.1BJA.74 AK-1-73-2224
Sponsored in part by National Inst. of Arthritis and Metabolic Diseases, Bethesda, Md.

Descriptors: *Uremia, Therapy, Membranes, Liquids, Capsules(Pharmacy), Ingestion(Biology), In vivo analysis, In vitro analysis, Ammonia, Removal, Phosphorus compounds, Urease, Urea.
Identifiers: Chronic diseases, *Liquid membrane capsules.

The objective is to develop the new liquid membrance capsule technology so that it can be used as an adjunct treatment of chronic uremia. Liquid membranes are thin spherical liquid shells which encapsulate a reagent separating it from the bulk phase outside the sphere. In the proposed use liquid membranes would be ingested. In vitro tests have shown that liquid membranes can be effective in trapping phosphate and ammonia. Studies also show liquid membrane encapsulated urease retains activity. In vivo tests with liquid membrane encapsulated x-ray opaque 'Gastrografin' showed normal movement through the small intestine. Small intestinal loops in dogs were perfused with liquid membrane encapsulated 50 wt.% H2SO4. The liquid membranes exited intact and no histopathologic changes were found.

PB-235 375/3GA PC$4.75/MF$2.25
Arkansas Rehabilitation Service, Little Rock.
A DEMONSTRATION TO DETERMINE THE EFFICACY OF PROVIDING REHABILITATION SERVICES TO THE ADULT DEAF IN AN ONGOING, COMPREHENSIVE REHABILITATION FACILITY FOR HANDICAPPED HEARING PERSONS.
Final rept. 1 Aug 65-31 May 68,
Gary D. Blake. 15 Jul 70, 86p
Grant SRS-RD-1932-S
Report on An Experiment in Serving Deaf Adults in a Comprehensive Rehabilitation Center, Hot Springs Rehabilitation Center, Hot Springs, Arkansas.

Descriptors: *Rehabilitation, *Auditory defects, Education, Vocational guidance, Adults, Handicapped workers, Facilities, Evaluation, Recommendations.
Identifiers: Health facilities.

The project was conducted to determine the effectiveness, the feasibility, and the desirability of providing rehabilitation services to adult deaf persons in an ongoing, residential comprehensive rehabilitation facility for handicapped hearing persons. The Hot Springs Rehabilitation Center, operated by the Arkansas Rehabilitation Service, was the project site. This Center, with an average daily enrollment of approximately 450 students offers a variety of services in three basic areas - evaluation, training, and medical. A number of deaf persons realized benefits through participation in the project. They were enhanced socially, vocationally, medically, and in other ways. Counselors were generally pleased as were the parents of the clients. It can be stated, therefore, that the program was desirable, effective, and feasible to an extent.

PB-235 377/9GA PC$3.75/MF$2.25
Johns Hopkins Univ., Baltimore, Md. School of Medicine.
REHABILITATION OF PATIENTS WITH CHRONIC RENAL FAILURE BY MEANS OF HEMODIALYSIS AND RENAL TRANSPLANTATION.
Final rept.,
W. Gordon Walker, and C. Robert Cooke. Jun 72, 33p
Grant SRS-RD-2966

Descriptors: *Surgical transplantation, *Rehabilitation, *Renal failure, Artificial kidneys, Patients, Urogenital diseases, Recommendations, Therapy.
Identifiers: *Hemodialysis, Chronic diseases.

The program has demonstrated the feasibility of rehabilitating patients with chronic renal failure through hemodialysis and renal transplantation. These therapeutic procedures sustain life and return to effective productivity patients who would otherwise die quickly from a fatal disorder. Although requiring continuing careful medical management, most patients have been able to return to their previous or similar employment or have resumed their education when this has been interrupted by their illness. A small number have required special training after successful transplantation to prepare them for future employment when previous experience or job training was lacking, or when their previous occupation was too demanding.

PB-235 414/0GA PC$7.25/MF$2.25
Vector Research, Inc., Ann Arbor, Mich.
A HEALTH MANPOWER MODEL EVALUATION STUDY. VOLUME I. ANALYSIS OF HEALTH MANPOWER MODELS.
Final rept. Sep 72-Jan 74,
Leonard F. Krystynak. Jan 74, 222p* BHME-72-18
Contract PHS-72-4313, N01-MI-24314

Descriptors: *Medical personnel, *Models, *Manpower utilization, Consumers, Medical services, Physicians, Nurses, Requirements, Planning, Evaluation, Recommendations.
Identifiers: Health care delivery systems.

The report identifies and describes health manpower analysis areas or policy issues confronting local, state, regional and national health manpower planning agencies. Fifty-six health manpower models are identified and described. The usefulness of the models is assessed by means of a comparative analysis between the analysis areas and the subject matter treated by the models and an assessment of model generality, validity, and operational feasibility. An in-depth evaluation of two large scale models was performed.

PB-235 543-SET/GA
Mag Tape $397.50;Foreign $497.50
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY DATA, 1969.
Data file,
George A. Schnack. 1969, 6 reels mag tape
NCHS/DF-74/008
Set includes PB-235 544 thru PB-235 548. Supersedes NCHS/DF-73/002.
Specify tape recording mode desired: 9 track, 800 0r 1600 BPI, odd parity, EBCDIC. Price includes documentation, PB-235 549 thru PB-235 552 and PB-235 554.

Descriptors: *Data file, *Medical services, *Dental services, *Magnetic tapes, *Health surveys, Musculoskeletal disorders, Skin diseases, Demographic surveys, Hospitalizing, Data storage, Data tapes, Medical records, Statistical data.

The sample is composed of approximately 42,000 households containing about 134,000 persons. Information is obtained on the number of restricted activity days, bed days, work or school-loss days, and all physician and dental visits occurring during the 2-week period prior to the week of the interview. Data are also obtained on the acute and chronic conditions which were responsible for these days or visits. Respondents are asked about long term limitation of activity and mobility and the chronic conditions leading to this disability. Information was obtained on muscle-skeletal-skin (this year's chronic condition slated for particular study). All conditions are coded to the international classification of diseases using the limited diagnostic detail available from a houshold respondent. Data are obtained about all hospital episodes during the prior 12 months, including length of stay, reason for entering hospital and whether surgery was performed. Data are also obtained on the interval since the last doctor and dental visit. Data are arranged for five different record types (household, person, condition, doctor visit, and hospital) with basic person data on each record...Source document: National Center for Health Statistics continuing nationwide survey of the U.S. civilian, noninstitutional population conduced by household interviews. The tape is available as 9-track, 800 bpi, odd parity, EBCDIC; only. Related document is Current Estimates from the Health Interview Survey, United States - 1969, Estimation and Sampling Variance in the Health Interview Survey.

PB-235 544/4GA
Mag Tape $97.50;Foreign $122.50
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY DATA, 1969 - HOSPITALS RECORDS.
Data file,

George A. Schnack. 1969, 1 reel mag tape
Also available from NTIS $397.50 (Foreign $497.50) in set of 6 magnetic tapes as PB-235 543-SET. Specify tape recording mode desired: 9 track, 800 or 1600 BPI, odd parity, EBCDIC. Price includes User's Guide, PB-235 549.

Descriptors: *Data file, *Medical services, *Hospitalizing, Magnetic tapes, Medical records, Musculoskeletal disorders, Skin diseases, Demographic surveys, Data storage, Data tapes, Medical records, Statistical data, *Health surveys.

The data file consists of the Hospitals record types only of the health interview survey. Information is obtained on the number of restricted activity days, bed days, work or school-loss days, and all physician and denta visits occurring during the 2-week period prior to the week of the interview. Data are also obtained on the acute and chronic conditions which were responsible for these days or visits. Respondents are asked about long term limitation of activity and mobility and the chronic conditions leading to this disability. Information was obtained on muscle-skeletal- skin (this year's chronic condition slated for particular study). All conditions are coded to the international classification of diseases using the limited dianostic detail available from a household respondent. Data are obtained about all hospital episodes during the prior 12 months, including length of stay, reason for entering hospital and whether surgery was performed. Data are also obtained on the interval since the last doctor and dental visit...Source document: National Center for Health Statistics continuing nationwide survey of the U.S. civilian, noninstitutional population conducted by household interviews. The tape is available as 9-track, 800 bpi, odd parity, EBCDIC; only. Related document is Current Estimates from the Health Interview Survey, United States - 1969, Estimation and Sampling Variance in the Health Interview Survey; these documents available from NTIS in microfiche only.

PB-235 545/1GA
Mag Tape $97.50;Foreign $122.50
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY DATA, 1969 - CONDITIONS RECORDS.
Data file,
George A. Schnack. 1969, 1 reel mag tape
Also available from NTIS $397.50 (Foreign $497.50) in set of 6 magnetic tapes as PB-235 543-SET. Specify tape recording mode desired: 9 track, 800 or 1600 BPI, odd parity, EBCDIC. Price includes User's Guide, PB-235 549.

Descriptors: *Data file, *Health surveys, *Medical services, *Dental services, Magnetic tapes, Musculoskeletal disorders, Skin diseases, Demographic surveys, Data storage, Data tapes, Hospitalizing, Medical records, Statistical data.

The data file consists of the conditions record types only. The sample is composed of approximately 42,000 households containing about 134,000 persons. Information is obtained on the number of restricted activity days, bed days, work or school-loss days, and all physician and dental visits occurring during the 2-week period prior to the week of the interview. Data are also obtained on the acute and chronic conditions which were responsible for these days or visits. Respondents are asked about long term limitation of activity and mobility and the chronic conditions leading to this disability. Information was obtained on muscle-skeletal-skin (this year's chronic condition slated for particular study). All conditions are coded to the international classification of diseases using the limited diagnostic detail available from a household respondent. Data are obtained about all hospital episodes during the prior 12 months, including length of stay, reason for entering hospital and whether surgery was performed. Data are also obtained on the interval since the last doctor and dental visit...Source document: National Center for Health Statistics continuing nationwide survey of the U.S. civilian, noninstitutional population conducted by household interviews. The tape is available as 9-track, 800 bpi, odd parity, EBCDIC; only. Related document is Current Estimates from the Health Interview Survey, United States - 1969, Estimation and Sampling Variance in the Health Interview Survey; these documents available from NTIS in microfiche only.

PB-235 546/9GA
Mag Tape $97.50;Foreign $122.50
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY DATA, 1969 - DCOTOR VISIT RECORDS.
Data file,
George A. Schnack. 1969, 1 reel mag tape
Also available from NTIS $397.50 (Foreign $497.50) in set of 6 magnetic tapes as PB-235 543-SET. Specify tape recording mode desired: 9-track, 800 or 1600 BPI, odd parity, EBCDIC. Price includes User's Guide, PB-235 549.

Descriptors: *Data file, *Medical services, *Dental services, *Health surveys, Magnetic tapes, Musculoskeletal disorders, Skin diseases, Demographic surveys, Data storage, Data tapes, Medical records, Statistical data.

The data file consists of the doctor visit records types only of the health interview survey. Information is obtained on the number of restricted activity days, bed days, work or school-loss days, and all physician and dental visits occurring during the 2-week period prior to the week of the interview. Data are also obtained on the acute and chronic conditions which were responsible for these days or visits. Respondents are asked about long term limitation of activity and mobility and the chronic conditions leading to this disability. Information was obtained on muscle-skeletal-skin (this year's chronic condition slated for particular study). All conditions are coded to the international classification of diseases using the limited diagnostic detail available from a household respondent. Data are obtained about all hospital episodes during the prior 12 months, including length of stay, reason for entering hospital and whether surgery was performed. Data are also obtained on the interval since the last doctor and dental visit...Source document: National Center for Health Statistics continuing nationwide survey of the U.S. civilian, noninstitutional population conducted by household interviews. The tape is available as 9-track, 800 bpi, odd parity, EBCDIC; only. Related document is Current Estimates from the Health Interview Survey, United States - 1969, Estimation and Sampling Variance in the Health Interview Survey; these documents available from NTIS in microfiche only.

PB-235 547/7GA
Mag Tape $97.50;Foreign $122.50
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY DATA, 1969 - HOUSEHOLD RECORDS.
Data file,
George A. Schnack. 1969, 1 reel mag tape
Also available from NTIS $397.50(Foreign $497.50) in set of 6 magnetic tapes as PB-235 543-SET. Specify tape recording mode desired: 9 track, 800 or 1600 BPI, odd parity, EBCDIC. Price includes User's Guide, PB-235 549.

Descriptors: *Data file, *Medical services, *Dental services, *Health surveys, Magnetic tapes, Musculoskeletal disorders, Skin diseases, Demographic surveys, Data storage, Data tapes, Medical records, Statistical data.

This data file consists of the household record types. Information is obtained on the number of restricted activity days, bed days, work or school-loss days, and all physician and dental visits occurring during the 2-week period prior to the week of the interview. Data are also obtained on the acute and chronic conditions which were responsible for these days or visits. Respondents are asked about long term limitation of activity and mobility and the chronic conditions leading to this disability. Information was obtained on muscle-skeletal-skin (this year's chronic condition slated for particular study). All conditions are coded to the international classification of diseases using the limited diagnostic detail available from a household respondent. Data are obtained about all hospital episodes during the prior 12 months, including length of stay, reason for entering hospital and whether surgery was performed. Data are also obtained on the interval since the last doctor and dental visit...Source document: National Center for Health Statistics continuing nationwide survey of the U.S. civilian, noninstitutional population conducted by household interviews. The tape is available as 9-track, 800 bpi, odd parity, EBCDIC; only. Related document is Current Estimates from the Health Interview Survey, United States - 1969, Estimation and Sampling Variance in the Health Interview Survey; these documents available from NTIS in microfiche only.

PB-235 548/5GA
Mag Tape $157.50;Foreign $197.50
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY DATA, 1969 - PERSONS RECORDS.
Data file,
George A. Schnack. 1969, 2 reels mag tape
Also available from NTIS $397.50 (Foreign $497.50) in set of 6 magnetic tapes as PB-235 543-SET. Specify tape recording mode desired: 9 track, 800 or 1600 BPI, odd parity, EBCDIC. Price includes User's Guide, PB-235 549.

Descriptors: *Data file, *Medical services, *Dental services, *Health surveys, Magnetic tapes, Musculoskeletal disorders, Skin diseases, Demographic surveys, Data storage, Data tapes, Medical records, Statistical data.

The data file consists of the persons record types only. The sample is composed of approximatley 42,000 households containing about 134,000 persons. Information is obtained on the number of restricted activity days, bed days, work or school-loss days, and all physician and dental visits occurring during the 2-week period prior to the week of the interview. Data are also obtained on the acute and chronic conditions which were responsible for these days or visits. Respondents are asked about long term limitation of activity and mobility and the chronic conditions leading to this disability. Information was obtained on muscle-skeletal-skin (this year's chronic condition slated for particular study). All conditions are coded to the international classification of diseases using the limited diagnostic detail available from a household respondent. Data are obtained about all hospital episodes during the prior 12 months, including length of stay, reason for entering hospital and whether surgery was performed. Data are also obtained on the interval since the last doctor and dental visit...Source document: National Center for Health Statistics continuing nationwide survey of the U.S. civilian, noninstitutional population conduced by household interviews. The tape is available as 9-track, 800 bpi, odd parity, EBCDIC; only. Related document is Current Estimates from the Health Interview Survey, United States - 1969, Estimation and Sampling Variance in the Health Interview Survey; these documents available from NTIS in microfiche only.

PB-235 549/3GA PC$5.25/MF$2.25
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY (HIS), 1969 FINAL TAPE RECORDS, USER'S GUIDE.
1969, 113p NCHS/DF-74/008a
See also PB-235 550. For data file on magnetic tape, see PB-235 543-SET.

Descriptors: *Medical records, *Medical services, Demographic surveys, Health, Hospitalizing, Interviews, Statistical data, Tables(Data).

Identifiers: *Health surveys.

The document contains a description of the five basic record types found on health interview survey final tape, 1969. These record types are household record, person record, condition record, hospital record, and doctor visit record. It also contains the record layout for these records.

PB-235 550/1GA PC$7.00/MF$2.25
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY, MEDICAL CODING MANUAL AND THE SHORT INDEX.
1969, 192p NCHS/DF-74/008b
See also PB-235 549 and PB-235 551.

Descriptors: *Medical services, *Medical records, Demographic surveys, Health, Hospitalizing, Diseases, Statistical data, Economic analysis.
Identifiers: *Health surveys.

Data collected in the health interview survey provide a statistical picture of illness and disability in the civilian, noninstitutional, population of the nation, as well as information on related subjects such as time lost from work or school because of illness and medical care received by persons who are ill. The health of the nation may be evaluated in economic terms, such as the loss of individual income or the reduction of total national economic production because of illness or injury. It may be evaluated in terms other than economic, such as the extent of occurrence of particular kinds of illness. Since the overall health of the nation is of vital importance, it is necessary to be able to measure health assets and liabilities in terms of the entire population.

PB-235 551/9GA PC$9.25/MF$2.25
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH INTERVIEW SURVEY, INTERVIEWER'S MANUAL (HIS--100), 1969.
1969, 312p NCHS/DF-74/008c
See also PB-235 550 and PB-235 552. For data file on magnetic tape, see PB-235 543-SET.

Descriptors: *Medical services, *Medical records, *Data acquisition, Interviews, Questionnaires, Demographic surveys, Health.
Identifiers: *Health surveys.

The document describes the purpose, sponsorship, design and scope of the National Health Survey. It also discusses in detail the housing unit and whom to include in the survey, sample units to include in the survey, the health questionnaire and how to conduct the interview.

PB-235 552/7GA PC$4.25/MF$2.25
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
HEALTH SURVEY PROCEDURE - CONCEPTS, QUESTIONNAIRE DEVELOPEMNT, AND DEFINITIONS IN THE HEALTH INTERVIEW SURVEY.
May 64, 71p PHS-Pub-1000-Ser-1-2 NCHS/DF-742008d, DHEW(HSM)-73-1083-Ser-1-2
See also PB-235 551 and PB-235 553. For data file on magnetic tape, see PB-235 543-SET.

Descriptors: *Medical services, *Medical records, *Data acquisition, Health, Interviews, Questionnaires, Demographic surveys, Methodology, Statistical data, Evaluation.
Identifiers: *Health surveys.

The document contains a description of the Health Survey Procedure. It explains the techniques and concepts used in gathering and evaluating health statistical data collected about the civilian, noninstitutional population of the United States. It discusses the concepts of morbidity, disability, and utilization of medical services and facilities. Questionnaire development and definition of terms used in statistical reports is also discussed.

PB-235 553/5GA PC-GPO/MF$2.25-NTIS
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
ESTIMATION AND SAMPLING VARIANCE IN THE HEALTH INTERVIEW SURVEY.
Jun 70, 34p PHS-Pub-1000-Ser-2-38 NCHS/DF-74/008e
Library of Congress catalog card no. 76-605819.
See also PB-235 552 and PB-235 554. For data file on magnetic tape, see PB-235 543-SET.
Paper copy available from GPO.

Descriptors: *Medical services, *Medical records, Statistical analysis, Statistical data, Health, Variance(Statistics), Evaluation.
Identifiers: *Health surveys.

The report presents a method for computing variances of estimates derived from the health interview survey (HIS). In addition it gives a brief description of the HIS sample design, a detailed account of how the estimator for health statistics is constructed, and an iterative method for fitting a curve to a set of variance estimates to obtain approximations that can be used for several different types of estimates derived from survey data.

PB-235 554/3GA PC$4.25/MF$2.25
National Center for Health Statistics, Rockville, Md. Div. of Health Interview Statistics.
CURRENT ESTIMATES FROM THE HEALTH INTERVIEW SURVEY, UNITED STATES-1969.
Apr 73, 65p PHS-Pub-1000-Ser-10-63 NCHS/DF-74/008f, DHEW(HSM)-73-1257-Ser-10-63
Library of Congress catalog card no. 65-62623. See also PB-235 553. For data file on magnetic tape, see PB-235 543-SET.

Descriptors: *Medical services, *Medical records, Health, Statistical data, Hospitalizing, Dental services, Tables(Data).
Identifiers: *Health surveys.

The report contains provisional estimates of incidence of acute conditions, number of persons reporting limitation of activity, number of persons injured, hospital discharges, persons with hospital episodes, disability days, and frequency of dental and physician visits. Based on data collected in the health interview survey during calendar year 1969.

PB-235 579/0GA PC$6.25/MF$2.25
Memorial Hospital for Cancer and Allied Diseases, New York.
REHABILITATION OF CANCER PATIENTS. TREATMENT FOR DISABILITIES RESULTING FROM THE EFFECTS OR ITS TREATMENT.
Final rept.,
J. Herbert Dietz, and Guy F. Robbins. Jan 71, 161p
Grant SRS-RD-2311-M

Descriptors: *Rehabilitation, *Malignant neoplasms, Patients, Questionnaires, Therapy, Surgery, Vocational guidance, Psychological guidance.
Identifiers: *Cancer, *Disabled persons.

Rehabilitation of the cancer patient requires care for a wide variety of disabilities with which the patients are left as a result of treatment by radical surgery, irradiation, or chemotherapy, or by the direct or remote effects of the disease itself. Disability may be either acute or chronic. Prompt attention in the form or preventive, as well as definitive, rehabilitation therapy for the patient can reduce disability, time for recovery, and incidence of complications. The first step in the provision of rehabilitation care is the early recognition by the attending physician of existing disability and ideally the recognition of potential disability. In the latter instance, for surgical patients, preoperative as well as postoperative counseling and training are of benefit.

PB-235 601/2GA PC$11.25/MF$2.25
Stanford Univ., Calif. Inst. for Communication Research.
HEALTH CARE AND SATELLITE RADIO COMMUNICATION IN VILLAGE ALASKA. FINAL REPORT OF THE ATS-1 BIOMEDICAL SATELLITE EXPERIMENT EVALUATION.
Final rept.,
Osvaldo Kreimer, Heather Hudson, Dennis Foote, Virginia Hunn Fowkes, and Bruce Lusignan. Jun 74, 430p LHNCBC-75-01
Contract N01-LM-1-4718

Descriptors: Medical services, *Telecommunication, *Radio communication, Alaska, Medical personnel, Paramedical sciences, Performance evaluation, Recommendations.
Identifiers: Allied health personnel, *Satellite communication systems.

The report presents results of an in-depth evaluation of the use of two-way satellite radio to improve health care in the Alaskan bush. The uses examined include communication between native health aides and doctors, between an isolated doctor and his colleagues, and continuing education. The findings concerning the major experiment, the health aide-to-doctor communication, include a vast increase over the old HF radio system in the number of cases 'seen,' high predicted effects on patient welfare as a result of the consultations, improved handling of emergency cases, and changes in the hospitalization patterns. The doctor-to-doctor and the continuing education experiments were both successful. Technical planning for an operational system using existing satellites is reported, and recommendations for action and for future research are made.

PB-236 087/3GA PC$3.25/MF$2.25
New England Deaconess Hospital, Boston, Mass.
STOMA REHABILITATION CLINIC.
Final rept.
1970, 15p SRS-RD-2703-001
Grant SRS-RD-2703-M

Descriptors: *Colostomy, *Ileostomy, *Rehabilitation, *Outpatient clinics, Surgery, Gastrointestinal system, Abdomen, Patients, New England.
Identifiers: Stoma, *Medical centers, Health facilities.

A pilot project (1967-1968) to establish a regional outpatient rehabilitation center in New England for clinical care and teaching of patients with abdominal stomas and as a professional resource center provided comprehensive medical and social aid to 88 stoma patients in its first year through the stoma rehabilitation clinic. Functioning as a rehabilitation unit, diagnostic center, technical resource, information center, and family and guidance center, the clinic received 43 percent of its referrals from local stoma groups. The project planned to assist the establishment of services to stoma patients in five New England states.

UR-3490-509 PC$4.25/MF$2.25
Rochester Univ., N.Y.
EFFECT OF HEMODIALYSIS ON INTRAERYTHROCYTIC PHOSPHATE COMPOUNDS AND ON OXYGEN BINDING TO HEMOGLOBIN.
M. A. Lichtman. 1974, 21p

Descriptors: (*Hemoglobin, *Chemical bonds), (*Oxygen, Chemical bonds), Alkaloids, Binding energy, Blood, Cell constituents, Dialysis, In vivo, Kidneys, Man, Phosphates.

For abstract, see NSA 30 08, number 23393.

6F. Environmental Biology

AD-785 660/2GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
MEASURES OF BIOTIC SIMILARITY AND THEIR APPLICATIONS TO CLUSTERING TECHNIQUES,
J. Gareth Pearson, Carlos F. A. Pinkham, and Kenneth S. Redus. 1973, 16p

Descriptors: *Biology, *Water pollution, *Sampling, Communities, Indexes(Ratios), Clustering, Ecology.
Identifiers: Biomass, *Bioindicators, *Indicator species.

The interest in 'indicator organisms', i.e., individuals or groups of organisms which reflect environmental quality has been rapidly expanding. Organisms have generally been grouped into three categories with regard to their pollution tolerance: tolerant, intermediate or facultative, and intolerant or sensitive. It is felt that application of this measure of biotic similarity can easily group organisms into these categories.

AD-785 684/2GA PC$3.25/MF$2.25
Letterman Army Inst of Research San Francisco Calif
INTERACTIONS BETWEEN MOSQUITO REPELLENTS AND HUMAN SKIN,
Thomas S. Spencer, Steven F. Bayles, Ronald K. Shimmin, Mark L. Gabel, and William A. Akers. 1974, 14p

Descriptors: *Insect repellents, Skin(Anatomy), Evaporation, Dosage, Temperature.
Identifiers: Effectiveness.

A large variation in duration has been demonstrated by a given repellent. This variability also reflects the minimum effective amount of repellent necessary to repel mosquitoes. Furthermore, differences in dry protection time (DPT) between repellents have been related to the evaporation rates of the repellent which influences both the DPT and the minimum effective dose (MED). Finally, one would expect to obtain the longest protection from mosquitoes with a repellent which has an evaporation rate close to the threshold of repellent vapor or minimum inhibitory concentration which is necessary to repel mosquitoes.

AD-785 685/9GA PC$3.25/MF$2.25
Army Tropic Test Center Apo New York 09827
VEGETATION EFFLUENTS, MICROORGANISMS AND MATERIAL DEGRADATION IN THE TROPICS,
James F. Sprouse. 1971, 13p

Descriptors: *Vegetation, *Materials, *Biodeterioration, Damage, Microorganisms, Tropical regions, Effluents, Panama Canal, Army, Organic Materials, Fungi, Test methods, Gas chromatography, Terpenes.
Identifiers: Air sampling.

A one year research project has recently been completed at the US Army Tropic Test Center, Ft. Clayton, Canal Zone which studied relationships between vegetation effluents, microorganisms and material deterioration. The study considered naturally occurring volatile organic materials from two standpoints. One was whether or not these materials provide a nutrient medium for microorganisms, and whether the materials actually contribute to accelerated biodeterioration of Army materiel. The second point of interest was to inventory the naturally occurring volatile organic materials to determine kinds and quantities which are present in the tropic environment.

AD-785 871/5GA PC$3.25/MF$2.25
Cornell Univ Ithaca N Y Dept of Entomology
MUSCOID-FLY OCTOSPOREOSIS.
Final rept. 1 Aug 71-31 Jul 74,
John P. Kramer. 1 Aug 74, 8p
Contract N00014-67-A-0077-0023
See also AD-764 082.

Descriptors: *Protozoa, *Spores, *Diptera, *Insect control, Stability, Entomology, Stress(Physiology), Germination.
Identifiers: *Biological insect control, *Octosporea muscoedomesticae.

Some general properties of Octosporea muscaedomesticae spores that bear upon their ability to withstand extra-corporeal stressors were investigated. It was demonstrated that: spores can tolerate pH 2.5 to 9.6 in an aqueous medium; withstand high X-irradiations (6000 and 10,000R) with little effect on their infectivity; be deactivated by ultraviolet irradiation within 60 minutes; in an aqueous medium withstand the effects of high temperature (65C) for at least two hours; in a clear aqueous medium held at 5C retain their infectivity for at least two years; held in host tissues at -20C remain infective for at least six months; at room conditions spores are viable for only eight months. It was also demonstrated that some spores do not germinate during their first passage through the alimentary tract of a fly. By selection based upon death time of the host, it was demonstrated that a strain of O. muscaedomesticae with increased fly-killing powers can be developed. (Modified author abstract)

AECL-4758 PC$5.75/MF$2.25
Atomic Energy of Canada Ltd., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
PRE-IRRADIATION STUDY OF TREE SIZE, AGE, AND GROWTH IN THE FIELD IRRADIATOR-GAMMA AREA.
J. R. Dugle, D. H. Thibault, and W. D. Fitzsimmons. May 74, 55p
U.S. Sales Only.

Descriptors: Canada, Chronic irradiation, Environment, External irradiation, Forests, Gamma sources, Irradiation procedures, Planning, Plant growth, Site selection, Size, Terrestrial ecosystems, Trees.

For abstract, see NSA 30 08, number 21168.

BMI-171-155 PC$5.00/MF$2.25
Battelle Columbus Labs., Ohio.
AMCHITKA BIOENVIRONMENTAL PROGRAM. STUDIES OF THE AVIFAUNA ON AMCHITKA ISLAND, ALASKA. FINAL PROGRESS AND SUMMARY REPORT, AUGUST 14, 1967--SEPTEMBER 30, 1973.
F. S. L. Williamson, and C. M. White. Aug 74, 38p
Contract AT(26-1)-171

Descriptors: (*Birds, *Ecology), (*Amchitka island area, Ecology), (*Milrow event, *Biological effects), (*Cannikin event, Biological effects), Abundance, Animal breeding, Behavior, Food, Population dynamics, Seas, Surface waters.

For abstract, see NSA 30 08, number 21170.

BNWL-SA-5050 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
IODINE UPTAKE PATTERNS AND WATER USE BY SEVERAL CROP PLANTS.
J. F. Cline, and B. Klepper. 15p CONF-740702-5
Contract AT(45-1)-1830

Descriptors: (*Iodine 129, *Uptake), (*Iodine 125, Uptake), (*Plants, *Radionuclide kinetics), Age dependence, Biological half-life, Crops, Leaves, Lettuce, Radioecological concentration, Soils, Spinach, Water.

For abstract, see NSA 30 08, number 21437.

BNWL-1828 PC$4.25/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
COMPUTER PROGRAM USED TO ESTIMATE PRIMARY PRODUCTIVITY FROM PH AND CARBON DIOXIDE DATA EMPLOYING THE UPSTREAM--DOWNSTREAM METHOD.
E. G. Wolf, and R. J. Olson. May 74, 24p
Contract AT(45-1)-1830

Descriptors: (*Aquatic ecosystems, *Productivity), Carbon dioxide, Conversion, Fresh water, In-situ method, Interpolation, Ph value, Programming.

For abstract, see NSA 30 08, number 23293.

N74-30463/5GA PC$3.75/MF$2.25
Saad (Geti), Karachi (Pakistan).
PERIODIC (SEASONAL AND YEARLY) CHANGES IN THE ORGANISM OF RATS: THEIR CAUSES AND EFFECTS.
N. I. Kalabukhov. Aug 74, 612p NASA-TT-F-14101
Contract NSF C-505
Tran-Transl. Into English of the Book "Periodicheskiye (Sezonnyye I Godichnyye) Izmeneniya V Organizme Gryzunov: Ikh Prichiny I Posledstviya" Leningrad, Nauka Press, 1969 p 1-249. Subm-Sponsored in Part by NASA.

Descriptors: *Annual variations, *Asia, *Physiological responses, *Rodents, Atmospheric temperature, Biological effects, Diseases, Metabolism, Physiological effects.

For abstract, see STAR 1220

N74-30464/3GA PC$37.75/MF$2.25
Saad (Geti), Karachi (Pakistan).
ECOLOGICAL PHYSIOLOGY OF ANIMALS.
A. D. Slonim. Aug 74, 693p NASA-TT-F-14203
Contract NSF C-505
Tran-Transl. Into English of the Book "Ekologicheskaya Fiziologiya Zhivotnykh" Moscow, Vysshaya Shkola Press, 1971 p 1-448.

Descriptors: *Adaptation, *Biological evolution, *Ecology, *Physiological responses, Climatology, Food, Genetics, Habitability, Physiological factors.

For abstract, see STAR 1220

N74-30481/7GA PC$7.00/MF$2.25
Utah State Univ., Logan.
PLANT ADAPTATION TO COLD. 1: CHLOROPHYLL. 2: MINERALS.
M.S. Thesis.
P. Rosen. 1972, 80p NASA-CR-139528
Contract NGR-45-002-008

Descriptors: *Adaptation, *Cold weather, *Plants (Botany), Chlorophylls, Growth, Low temperature environments, Membranes, Snow.

For abstract, see STAR 1220

N74-30834/7GA PC$0.55/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
THE USE OF REMOTE SENSING IN MOSQUITO CONTROL.
Feb 73, 17p NASA-TM-X-70293, MSC-07644
Misc-Original Contains Color Illustrations.

Descriptors: *Insects, *Mapping, *Remote sensors, *Topography, Aerial photography, Photointerpretation, Spaceborne photography.

For abstract, see STAR 1220

PB-235 359/7GA PC$3.75/MF$2.25
Everglades National Park, Homestead, Fla. Div. of Natural Science and Resource Management Studies.
PESTICIDES, POLYCHLORINATED BIPHENOLS AND HEAVY METALS IN UPPER FOOD CHAIN LEVELS, EVERGLADES NATIONAL PARK AND VICINITY.
Final rept.,
John C. Ogden, William B. Robertson, Gary E. Davis, and Thomas W. Schmidt. Aug 74, 30p DI-SFEP-74-16
Revision of report dated Mar 73.

Descriptors: *Environmental surveys, *Pesticides, *Metals, *Food chains, Contaminants, Poisons, Ecology, Wildlife, Aquatic animals, Metabolism, Toxicity, Florida, National parks.

Identifiers: Everglades National Park, Pesticide residues, Water pollution effects(Animals).

A general concern over possible environmental pollution by man-made poisons prompted the extensive survey of chlorinated insecticides, polychlorinated biphenyls, and metals in upper trophic levels of material collected in and adjacent to Everglades National Park. Collections were made between 1971 and 1973, and analyses conducted by WARF, Inc., Madison, Wisconsin. The resulting analyses provides a base line for future analyses, and clues for particular poisons or particular species in need of more intensive study. These data revealed that DDT, DDE, DDD, Dieldrin and PCBs appear to exist in concentrations well below amounts known to have either acute or chronic effects. Less is known of the significance of the various metal concentrations reported here, although levels of mercury in freshwater vertebrates and arsenic in marine species are great enough to deserve more intensive study.

PB-235 823/2GA PC$3.25/MF$2.25
Michigan State Univ., East Lansing. Dept. of Entomology.
STUDIES ON THE EFFECTS OF SEWAGE EFFLUENT ON SELECTED GROUPS OF ARTHROPODS AND PHYTOPATHIC NEMATODES.
Completion rept. 1 Jul 73-30 Jun 74,
Harold D. Newson. Sep 74, 17p W74-12202, OWRR-A-074-MICH(1)
Contract DI-14-31-0001-4022

Descriptors: *Nematoda, *Sewage disposal, *Arthropoda, *Insects, Effluents, Michigan, Water quality, Ecology, Disease vectors, Water pollution, Water reclamation, Sewage disposal, Culicidae, Diptera, Wildlife.
Identifiers: *Water pollution effects(Animals), Sewage irrigation, Mosquitoes.

Results are presented of a one-year study conducted at the Michigan State University Water Quality Management Project in East Lansing, Michigan. The primary objective of the study was to obtain pre-operational baseline data that could be used as points of reference in planned studies to determine the long term effects of this sewage irrigation project on the haematophagous insects, soil microarthropods and phytopathic nematodes in the project site. This included specific efforts to identify the haematrophagous insects that were indigenous to the project area, to assess their potential as human or animal pests and/or disease vectors, and to identify and categorize the soil microarthropods and phytopathic nematodes that now are present in the proposed irrigation plots and the areas adjacent to the water impoundments constructed for the project.

PB-235 837/2GA PC$3.25/MF$2.25
Oklahoma Water Resources Research Inst., Stillwater.
EFFECTS OF CADMIUM SALTS ON THE REPRODUCTIVE POTENTIAL OF MALE RAINBOW TROUT AS DETERMINED BY IN VIVO AND IN VITRO TECHNIQUES.
Rept. for 1 Jul 72-30 Jun 74,
William C. Sanford. 30 Jun 74, 17p W74-12204, OWRR-A-042-OKLA(1)
Contract DI-14-31-0001-4036

Descriptors: *Reproduction(Biology), *Trout, *Cadmium, Water pollution, Growth curves, In vivo analysis, In vitro analysis, Fisheries, Cells(Biology), Tissue culture, Physiological effects, Morphology, Germ cells, Experimental data, Toxicity.
Identifiers: *Water pollution effects(Animals), Rainbow trout, Salmo gairdneri, Cadmium chlorides.

A new method for dispersing strongly adhesive cells which uses trypsin and EDTA and ultrasonic sound at non-destructive levels, has been applied to cultures of rainbow trout gonad (RTG-2) cells and has yielded monodisperse cells. Cadmium chloride was added to Liebovitz L-15 medium to give concentrations of 0, 1, 5 and 10 mg CdCl2/l to determine the effect of Cd on the growth rate and morphology of rainbow trout gonad cells. One mg CdCl2/l had very little effect on the cells with growth rates and morphology equivalent to control cells lacking CdCl2. After 6 days contact with 5 mg CdCl2/l, a depression in growth rate below control levels was observed as well as morphologic change in cells characterized by decreased substrate adhesion and the formation of thin granular cellular projections. At 10 mg CdCl2/l a rapid loss of cells occurred with a loss of cellular integrity.

PB-235 910/7GA PC$4.75/MF$2.25
Oklahoma Water Resources Research Inst., Stillwater.
EFFECTS OF RESIDUAL TOXINS IN OIL REFINERY EFFLUENTS ON AQUATIC ORGANISMS.
Technical completion rept.,
Troy C. Dorris, Sterling L. Burks, and George R. Waller. 30 Jun 74, 81p W74-12348, OWRR-B-025-OKLA(1)
Contract DI-14-31-0001-3927

Descriptors: *Petroleum refining, *Water pollution, *Toxins and antitoxins, *Aquatic biology, Oils, Minnows, Sludge, Waste water, Toxicology, Bioassay, Crustacea, Evaporation, Inorganic salts, Chemical analysis, Fishes, Tables(Data).
Identifiers: *Water pollution effects(Animals), Lagoons(Ponds), Pimephales promelas, Oil pollution, Daphnia magna, *Waste water treatment.

Laboratory evaluations of partial evaporation of oil refinery wastewaters were performed to determine removal of toxic substances by partial evaporation, suitability for discharge to a receiving stream of the bottom partially concentrated waters from an evaporator, and acceptability of overhead evaporator product water for reuse as boiler make-up or other uses. The wastewaters from biological treatment--lagoon and activated sludge units--and from primary treatment facilities--API separator and air flotation--were partially evaporated in rotating thin-film or columnar falling film evaporators. Conclusions were that partial evaporation of biologically treated oil refinery wastewater, removes toxic substances from biologically treated oil refinery wastewaters, produces an overhead product water which has low inorganic salt concentration and should be reusable for boiler make-up or other uses where high-quality water is desirable, and produces a partially concentrated bottom product water generally less toxic.

SRO-819-1 PC$8.00/MF$2.25
Savannah River Ecology Lab., Aiken, S.C.
REPORT OF ECOLOGICAL RESEARCH AT SAVANNAH RIVER ECOLOGY LABORATORY. ANNUAL REPORT, AUGUST 1971--MAY 1, 1974.
W. M. Lewis, M. H. Smith, R. J. Beyers, J. B. Gentry, and J. W. Gibbons. 31 May 74, 96p
Contract AT(38-1)-819

Descriptors: (*Savannah river plant, *Ecology), (*Thermal effluents, *Biological effects), (*Ecosystems, *Radionuclide migration), Animals, Cesium 137, Environment, Minerals, Plants, Populations, Thermal pollution.

For abstract, see NSA 30 08, number 21181.

SRO-819-2 PC$10.25/MF$2.25
Savannah River Ecology Lab., Aiken, S.C.
PARTIAL BIBLIOGRAPHY OF INTEREST TO THOSE MEASURING AQUATIC PRIMARY PRODUCTIVITY WITH SOME THEORETICAL CONSIDERATIONS REGARDING SUCH MEASUREMENTS. PERIOD COVERED: SEPTEMBER 1964--JANUARY 1, 1973.
R. J. Beyers, and B. J. Beyers. 1 Jul 74, 142p
Contract AT(38-1)-819

Descriptors: (*Plankton, *Productivity), (*Algae, Productivity), (*Aquatic ecosystems, *Bibliographies), Carbon 14, Measuring methods, Photosynthesis, Plants, Tracer techniques.

For abstract, see NSA 30 08, number 23389.

6H. Food

AD-785 656/0GA PC$3.25/MF$2.25
Army Natick Labs Mass
A SYSTEM FOR EVALUATION OF MILITARY MENUS.
Howard R. Moskowitz. 1973, 13p

Descriptors: *Food dispensing, *Military facilities, Surveys, Military personnel, Diet, Nutrition, Habits.
Identifiers: *Food habits, Evaluation, *Food services management.

The study provides information both about the food habits of respondents (i.e.), information about how they perceive foods) and allow for the possibility of eventually constructing menus that optimize preference. The data should be disentangled into (a) information about empirical time-preference functions, which are obtained from surveys (b) hypotheses about rules for time-preference behavior of foods that are served in a repetitive menu (c) hypotheses about the rules of combinations that an individual uses in deciding about overall menu preference from information about component preferences (d) possibilities for optimizing menus to maximize preference, and (e) possibilities for optimizing selections by knowing the distribution of individual preferences for each item at each menu day (selection opportunity).

AD-785 961/4GA PC$3.75/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
B-52 CREW EVALUATION OF THERMOSTABILIZED FOODS.
Final rept. Jun-Sep 72,
Joseph C. Crigler, John E. Vanderveen, Donald M. Tucker, and May O. Klebanoff. Jul 74, 29p Rept no. SAM-TR-74-11

Descriptors: *Military rations, *Food processing, Texture, Taste, Acceptability, Storage, Military requirements, Surveys, Pilots, Jet bombers.
Identifiers: Evaluation, *Thermostabilized foods.

A total of 453 thermostabilized meals--each consisting of an entree, two vegetables, and a dessert--were evaluated by 289 crewmembers aboard B-52 aircraft during 15 days of combat in July 1972. Each food item was rated for appearance, texture, flavor, and overall acceptability. Among respondents, 64.3% preferred the thermostabilized meals to the existing frozen meals; and 76.1%, to the foil-pack meal. If the frozen food system is replaced by the thermostabilized food system, the weight and volume requirements for storage and preparation can be reduced by approximately half. (Author)

AD-785 978/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
3,4-BENZPYRENE CONTENT IN SKINLESS FRANKFURTERS PRODUCED ON A CONTINUOUS-FLOW LINE.
B. S. Ruchkovskii, V. V. Konstantinov, M. A. Tiktin, M. M. Morgulis, and G. K. Babanov. 9 Nov 73, 7p Rept no. FSTC-HT-23-1409-73
Trans. of Voprosy Pitaniya (USSR) v31 n1 p74-77 1972.

Descriptors: *Carcinogens, Physicochemical properties, Bacteriology, Meat, Hygiene, USSR, Translations.
Identifiers: *Benzopyrenes, *Food processing, Organoleptic effects.

A new, highly economical continuous-flow method of making skinless frankfurters has been

devised. A comprehensive study of frankfurters prepared by the new technique showed that their physico-chemical, bacteriological, and organoleptic properties did not differ from those of frankfurters prepared with techniques in current use; they also posessed good taste quality. They contained, moreover, much less 3,4-benzpyrene than frankfurters prepared by ordinary methods. Ten samples of 'Russian' style frankfurters contain, on the average, 0.59 microgram/kg of this carcinogen, but 9 samples of the skinless frankfurters averaged 0.0044 microgram/kg.

N74-30490/8GA PC$6.25/MF$2.25
Technology, Inc., Houston, Tex. Life Sciences Div.
SKYLAB FOOD SYSTEM LABORATORY SUPPORT.
Final Report, 1 May 1972 - 30 Jun. 1974.
D. Sanford. 30 Jun 74, 65p NASA-CR-134380
Contract NAS9-12926

Descriptors: *Food, *Life support systems, *Skylab program, *Space flight feeding, Canning, Frozen foods, Hardware, Inventory management, Nutritional requirements, Quality control, Space storage, Systems engineering.

For abstract, see STAR 1220

N74-30492/4GA PC$11.50/MF$2.25
Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM STUDY. VOLUME 2, APPENDIX A: ACTIVE HEATING SYSTEM-SCREENING ANALYSIS. APPENDIX B: RECONSTITUTED FOOD HEATING TECHNIQUES ANALYSIS.
Final Report.
1974, 170p NASA-CR-134375
Contract NAS9-13138

Descriptors: *Food, *Heating equipment, *Space flight feeding, *Space shuttles, *Systems analysis, Compatibility, Cost estimates, Gravitational effects, Manned space flight, Microwave equipment, Ovens, Project planning, Safety factors.

For abstract, see STAR 1220

N74-30493/2GA PC$10.75/MF$2.25
Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM. VOLUME 2, APPENDIX C: FOOD COOLING TECHNIQUES ANALYSIS. APPENDIX D: PACKAGE AND STOWAGE: ALTERNATE CONCEPTS ANALYSIS.
1974, 151p NASA-CR-134376
Contract NAS9-13138

Descriptors: *Cooling systems, *Food, *Packaging, *Space flight feeding, *Space shuttles, *Space storage, *Systems analysis, Ammonia, Heat sinks, Project planning, Refrigerants, Spacecraft configurations, Spacecraft power supplies, Thermoelectric cooling, Vapor phases, Volume, Weight analysis.

For abstract, see STAR 1220

N74-30494/0GA PC$15.75/MF$2.25
Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM STUDY. VOLUME 2, APPENDIX F: FLIGHT FOOD AND PRIMARY PACKAGING.
Final Report.
1974, 252p NASA-CR-134378
Contract NAS9-13138

Descriptors: *Food, *Packaging, *Space flight feeding, *Space shuttles, *Systems analysis, Nutritional requirements, Project planning, Space storage, Volume.

For abstract, see STAR 1220

N74-30495/7GA PC$6.00/MF$2.25
Pillsbury Mills, Inc., Minneapolis, Minn.
SPACE SHUTTLE/FOOD SYSTEM STUDY. VOLUME 2, APPENDIX G: GROUND SUPPORT SYSTEM ANALYSIS. APPENDIX H: GALLEY FUNCTIONAL DETAILS ANALYSIS.
1974, 60p NASA-CR-134379
Contract NAS9-13138

Descriptors: *Food, *Ground support systems, *Space flight feeding, *Space shuttles, *Spacecraft components, *Systems analysis, Inventory management, Logistics, Project planning, Reliability analysis, Storage, Waste disposal.

For abstract, see STAR 1220

N74-30499/9GA PC$5.50/MF$2.25
Houston Univ., Tex. Dept. of Mechanical Engineering.
CHARACTERIZATION OF HEAT TRANSFER IN NUTRIENT MATERIALS, PART 1.
Final Report.
J. E. Cox, R. B. Bannerot, C. K. Chen, and L. C. Witte. 31 Mar 73, 47p NASA-CR-134382
Contract NAS9-11676

Descriptors: *Heat transfer, *Nutrients, *Thermodynamic properties, Conductive heat transfer, Convective heat transfer, Heating equipment, Radiative heat transfer, Skylab program, Space flight feeding.

For abstract, see STAR 1220

N74-30500/4GA PC$5.25/MF$2.25
Houston Univ., Tex. Dept. of Mechanical Engineering.
CHARACTERIZATION OF HEAT TRANSFER IN NUTRIENT MATERIALS, PART 2.
Final Report.
J. E. Cox, R. B. Bannerot, C. K. Chen, and L. C. Witte. 31 Dec 73, 43p NASA-CR-134383, REPT-9-11676-32-PT-2
Contract NAS9-11676

Descriptors: *Heat transfer, *Nutrients, *Thermodynamic properties, Conductive heat transfer, Convective heat transfer, Heating equipment, Radiative heat transfer, Skylab program, Space flight feeding.

For abstract, see STAR 1220

PB-235 410/8GA PC$4.75/MF$2.25
National Academy of Sciences-National Research Council, Washington, D.C.
FOOD SCIENCE IN DEVELOPING COUNTRIES: A SELECTION OF UNSOLVED PROBLEMS.
1974, 92p*
Contract AID/csd-2584
Library of Congress Catalog Card No. 74-1602.

Descriptors: *Human nutrition, *Food, *Developing countries, New technology, Resources, Preserving, Processing, Storage, Food composition, Food deterioration, Problem solving.

The report presents a collection of selected problems in the fields of food science and nutrition which are of immediate concern to developing countries. Each problem is organized under the following headings: Problem description; background information; possible approaches to a solution; special requirements; bibliography; and key contact(s).

6J. Industrial (Occupational) Medicine

AD-785 740/2GA PC$5.75/MF$2.25
Louisville Univ Ky Performance Research Lab
BEHAVIORAL EFFECTS OF PROLONGED EXPOSURE TO CONTINUOUS AND INTERMITTENT NOISE.
Interim technical rept. 1 Jul 71-30 Jun 72,
John D. Repko, Bill R. Brown, and Michel Loeb.
Jun 74, 142p* Rept no. ITR-74-29
Contract DAHC19-69-C-0009

Descriptors: *Noise pollution, *Stress(Psychology), *Industrial hygiene, Psychophysiology, Performance(Human), Behavior, Military personnel, Acoustics, Environments, Thresholds(Physiology), Physiological effects, Exposure(Physiology), Psychoacoustics.

The purpose of this investigation was to assess man's performance in a work situation wherein 90 dB continuous and periodic 96 dB intermittent noise were separately presented as environmental or work-situation stressors. The present study employed a synthetic-work approach in which several tasks were combined into a multiple-task performance battery (MTPB) consisting of six tasks selected to test both individual- and small-group (crew) performance. The results, showed that the mean percentage of baseline performance was enhanced by a periodic 96 dB intermittent noise. On the other hand, since continuous noise may be considered as containing fewer stimulus elements than intermittent noise, it was expected that general performance during continuous noise would be less than during intermittent noise. (Modified author abstract)

ORNL-TM-4051 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
AEROSOL PHYSICS OF ASBESTOS FIBERS: INTERCEPTION.
B. R. Fish. Jul 74, 18p
Contract W-7405-eng-26

Descriptors: (*Asbestos, *Health hazards), (*Aerosols, Health hazards), Air cleaning, Air samplers, Deposition, Elongation, Fibers, Lungs, Orientation, Respiratory system, Size, Toxicity, Transport.

For abstract, see NSA 30 08, number 23422.

6K. Life Support

AD-785 749/3GA Reprint
Johns Hopkins Univ Baltimore Md
MAN IN THE POLAR SEA.
Technical rept.,
G. Carlton Ray. 2 Sep 74, 6p Rept no. TR-3
Contract N00014-67-A-0163-0010
Availability: Pub. in Arctic Logistics Support Technology, p79-82 1972.

Descriptors: *Diving, *Arctic Ocean, *Chukchi Sea, Heat transfer, Sea ice, Closed ecological systems, Underwater equipment, Heat loss, Diver equipment, Safety, Divers, Submersibles, Polar regions.

The problems of diving in the polar regions are discussed with particular attention given to the question of heat flow. Necessary safety techniques described include the horizontal drift line attached to the main descent line in order to return to the descent hole. Two sub-ice observation chambers are described. The potential of submersibles in under-ice scientific studies is emphasized. (Author)

COM-74-11349/9GA Reprint
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
'PORTALAB', AN INEXPENSIVE SELF-BALLASTING HABITAT,
Albert P. Davis, Jr., and Hilbert V. Schenck, Jr.
1974, 9p Marine Reprint-17 NOAA-74070503
Grant NOAA-04-3-158-3
Pub. in Marine Technology Society Jnl., v8 n2 p39-44 Feb 74.

Descriptors: *Underwater life support systems, *Underwater habitats, Ballast, Stability, Carbon dioxide, Humidity, Cost estimates, Research, Oceanography, Salvage.
Identifiers: Sea Grant program.

Portalab is a small, nine-ton, shallow-water habitat designed for minimum effort in launching and deployment. Three interior ballast tanks give the unit great stability during launch and tow and permit a slow, stable submergence during emplantment under the control of two scuba divers. The unit is shore-pumped through 3/4-inch I.D. hose and interior humidity is controlled by drying the shore air before it enters the habitat. Data on CO2 flushing and humidity levels are presented for the habitat submerged in 37 feet of water. The Portalab design adequately fills most practical needs for a small, short-term, shallow-water habitat costing less than $1,000 for construction materials.

COM-74-50936/5GA PC-GPO/MF$2.25-NTIS
National Oceanic and Atmospheric Administration, Rockville, Md. Office of Manned Undersea Science and Technology.
MANNED UNDERSEA SCIENCE AND TECHNOLOGY FISCAL YEAR 1973 REPORT.
May 74, 65p NOAA-74090406
Paper copy available from GPO $1.00.

Descriptors: *Underwater environments, *Diving, Deep ocean vehicles, Ecology, Undersea habitat atmospheres, Safety, Underwater life support systems, Project planning.

The second annual report of the Manned Undersea Science and Technology (MUS and T) Program of the National Oceanic and Atmospheric Administration (NOAA), describes the purpose, objectives, and nature of the program and its associations with other Federal and State agencies and private and academic institutions. The purpose is primarily to foster those manned underwater scientific investigations that meet the needs and requirements of NOAA and to encourage studies that may lead to improved safety and versatility of manned undersea operations. Also, the program includes liaison, advice, and support for Federal, State, and academic bodies performing manned undersea work for fiscal year 1973.

N74-30496/5GA PC$24.00/MF$2.25
Structural Composites Industries, Inc., Azusa, Calif.
IMPROVED FIREMAN'S COMPRESSED AIR BREATHING SYSTEM PRESSURE VESSEL DEVELOPMENT PROGRAM.
H. A. King, and E. E. Morris. Aug 73, 419p
NASA-CR-134385, SCI-7338
Contract NAS9-12414

Descriptors: *Breathing apparatus, *Compressed air, *Oxygen supply equipment, *Pressure vessels, Acceptability, Aluminum, Equipment specifications, Glass fibers, Life support systems, Performance tests, Systems engineering.

For abstract, see STAR 1220

N74-30497/3GA PC$13.75/MF$2.25
Martin Marietta Corp., Denver, Colo.
FIREFIGHTER'S COMPRESSED AIR BREATHING SYSTEM PRESSURE VESSEL DEVELOPMENT PROGRAM.
Final Report.
E. J. Beck. Aug 74, 211p NASA-CR-134384, MCR-73-214
Contract NAS9-12540

Descriptors: *Breathing apparatus, *Compressed air, *Fire fighting, *Pressure vessels, Human factors engineering, Portable equipment, Safety, Specifications.

For abstract, see STAR 1220

N74-30498/1GA PC$7.00/MF$2.25
Life Systems, Inc., Cleveland, Ohio.
SIX-MAN, SELF-CONTAINED CARBON DIOXIDE CONCENTRATOR SUBSYSTEM FOR SPACE STATION PROTOTYPE (SSP) APPLICATION.
Final Report.
G. D. Kostell, F. H. Schubert, J. W. Shumar, T. M. Hallick, and F. C. Jensen. May 74, 77p NASA-CR-114742, LSI-ER-170-34
Contract NAS2-6478

Descriptors: *Air purification, *Carbon dioxide concentration, *Life support systems, *Quality control, Equipment specifications, Manned spacecraft, Performance tests, Prototypes, Space stations.

For abstract, see STAR 1220

N74-30567/3GA PC$5.25/MF$2.25
Midwest Research Inst., Kansas City, Mo.
DEVELOPMENT AND UTILIZATION OF TECHNOLOGY, CONTRIBUTIONS FROM NASA LIFE SUPPORT SYSTEMS: BRUSHLESS DC MOTORS.
Final Report.
3 May 74, 73p NASA-CR-139392
Contracts NASW-2454, MRI PROJ. 3720-D

Descriptors: *Life support systems, *Technology utilization, Astronauts, Direct current, Technology assessment.

For abstract, see STAR 1220

6L. Medical and Hospital Equipment

AD-785 630/5GA PC$3.25/MF$2.25
Army Medical Bioengineering Research and Development Lab Fort Detrick Md
CELL AND ORGAN CULTURE SYSTEMS TO EVALUATE BIODEGRADATION AND BIOCOMPATIBILITY OF POLYMERS,
Andrew F. Hegyeli, and James C. Eaton, Jr. 1973, 16p

Descriptors: *Tissue culture, *Biological material, *Polymers, Mechanical organs, Surgical supplies, Biodeterioration, Stability, In vitro analysis, Histology.
Identifiers: *Biomaterials, Evaluation.

Polymers have long been used as surgical implants. Systematic tests of polymers for biocompatibility started in 1949, when Aries implanted nylon sutures in dogs and observed the tissue reaction to the polymer and the effect of the bio-environment on the plastic. In 1945 Blum introduced tissue culture systems for the in vitro screening of cytotoxicity of polymers. The first in vitro biodegradation test was developed in the authors' laboratory. The three tests described in this paper are routinely used for the preliminary screening of surgical polymers or for candidate materials obtained commercially. The data obtained with these methods are in good correlation with in vivo implantation studies and thus provide an important tool in materials development.

AD-785 674/3GA PC$3.25/MF$2.25
Brooke Army Medical Center Fort Sam Houston Tex Army Inst of Surgical Research
ARTIFICIAL TENDONS FOR WAR INJURIES: CONSTRUCTION AND TISSUE RESPONSE,
Roger E. Salisbury, Arthur D. Mason, Jr., Basil A. Pruitt, Jr., Clarence W. R. Wade, and Daniel W. McKeel, Jr. 26 Aug 74, 15p
Prepared in cooperation with Fort Detrick, Frederick, Md.

Descriptors: *Tendons, *Synthetic materials, *Prosthetics, Musculoskeletal system, Warfare, Wounds and injuries, Response(Biology), Pathology, Surgery, Chickens, Laboratory animals, Experimental data, Histology, Synthetic rubber.
Identifiers: Biomaterials.

Combat injuries to the hand often result in massive destruction of skin and soft tissue, bones, nerves, and tendons, necessitating many reconstructive procedures and a long convalescence. One of the most disabling injuries is destruction of the flexor tendons of the fingers, not amenable to conventional tendon surgery such as primary suture or delayed tendon grafting. The purpose of this study was to design artificial tendons for use in these injuries and to test their acceptance by the host.

AD-785 735/2GA PC$3.75/MF$2.25
Medical Coll of Wisconsin Milwaukee
EVALUATION AND DEVELOPMENT OF ELECTRICAL ANESTHESIA DEVICE.
Rept. no. 5 (Final comprehensive),
Anthony Sances, Jr., and Sanford J. Larson. 24 May 74, 46p
Contract DA-49-193-MD-2816

Descriptors: *Electroanesthesia, *Bioinstrumentation, Anesthesia, Waveforms, Physiology, Monkeys, Experimental data, Drugs.
Identifiers: Evaluation.

A study was done in the monkey to compare sine wave electroanesthesia (EA) currents at frequencies ranging from 100 Hz to 10 kHz; dual sine wave EA currents at three separation frequencies of 100 Hz, 500 Hz and 1 kHz; biased rectangular pulses with a 10 to 20% on time and repetition rates from 30 to 1,000 pulses per second; rectangular interburst frequencies of 10 to 20% on time, repetition rates from 50 to 500, with interburst frequencies from 1 kHz to 50 kHz. Each of these waveforms was evaluated in monkeys given no drugs, Midocalm, Droperidol, Sodium Pentathol, Phenobarbital or Atropine. For the levels of drugs used the most consistent physiologic findings were obtained with the barbiturate preanesthetic drugs. For anesthesia, the average value of the 10% on time rectangular pulse was less than the 20% on time pulse. The least amount of average EA current was required for the rectangular interburst pulse currents, the next greatest amount for biased rectangular pulses, followed by the single sine wave and double sine wave currents. (Modified author abstract)

AD-785 960/6GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
AN ELECTRONIC THERMOMETER FOR USE IN AEROMEDICAL AIRLIFT.
Final rept. Jun 70-Jul 73,
Jeanne L. Curtis. Jul 74, 8p Rept no. SAM-TR-74-26

Descriptors: *Aeromedical evacuation, *Thermometers, *Temperature measuring instruments, Electronics, Bioinstrumentation.

A digital electronic thermometer was selected to provide aeromedical personnel with a device safer, more sanitary, and more efficient than the mercury-in-glass clinical thermometer. Specifications required the item to be a lightweight portable unit offering a safe, sanitary, accurate, and efficient means of taking patient's temperatures in-flight. The evaluations indicated the digital electronic thermometer with a special electromagnetic-interference-suppression case was satisfactory for operational use in aeromedical evacuation. (Author)

AD-786 249/3GA Reprint
Naval Blood Research Lab Chelsea Mass
THE PURIFICATION OF RED CELLS FOR TRANSFUSION BY FREEZE PRESERVATION AND WASHING. I. THE MECHANISM OF LEUKOCYTE REMOVAL FROM WASHED, FREEZE-PRESERVED RED CELLS,
James P. Crowley, and C. Robert Valeri. 3 Dec 73, 10p
Revision of report dated 19 Jul 73. See also Part 2, AD-786 250.

Availability: Pub. in Transfusion, v14 n3 p188-195 May/Jun 74.

Descriptors: *Blood preservation, *Erythrocytes, *Leukocytes, Blood transfusion, Purification, Removal, Sedimentation, Dextran, Freezing, Glycerols.
Identifiers: HLA antibodies.

Leukocytes were removed from washed, freeze-preserved red blood cells primarily by the clumping together of damaged cells. This agglomeration was associated with membrane and nuclear changes which were usually manifested after the removal of glycerol from the red blood cells. Washing glycerolized, freeze-preserved leukocytes with solutions containing deoxyribonuclease prevented the agglomeration. Polymorphonuclear granulocytes were preferentially damaged and removed. Of the residual leukocytes that were isolated by the dextran sedimentation method, 70 per cent were lymphocytes. The dye exclusion test showed that the majority of the agglomerated leukocytes were nonviable, while the majority of the leukocytes isolated by dextran sedimentation were viable. The agglomerated material ranged in size from macroscopic aggregates to microscopic particles with a minimum diameter of 40-50 microns. HL-A antibody adsorption demonstrated that particulate antigenic material was present in the washed red blood cells which could be decreased by micropore filtration. (Author)

AD-786 250/1GA Reprint
Naval Blood Research Lab Chelsea Mass
THE PURIFICATION OF RED CELLS FOR TRANSFUSION BY FREEZE PRESERVATION AND WASHING. II. THE RESIDUAL LEUKOCYTES, PLATELETS, AND PLASMA IN WASHED, FREEZE-PRESERVED RED CELLS,
James P. Crowley, and C. Robert Valeri. 3 Dec 73, 9p
Revision of report dated 19 Jul 73. See also Part I, AD-786 249.
Availability: Pub. in Transfusion, v14 n3 p196-202 May/Jun 74.

Descriptors: *Blood preservation, *Erythrocytes, Blood transfusion, Purification, Freezing, Glycerols, Leukocytes, Blood platelets, Blood plasma, Proteins, Removal.

In the study of 125 units of washed, previously frozen red blood cells approximately 96.6 per cent of the leukocytes and 98.9 per cent of the platelets were removed. Less than 0.5 mg of plasma protein remained per unit. The length of storage as whole blood at 4C prior to glycerolization of the red blood cells influenced the number of leukocytes in the washed, previously frozen red blood cells. Red blood cells frozen on the day of collection had 7.2 per cent residual white cells, whereas those stored at 4C for 10 days or longer prior to glycerolization, freezing, and washing had 1.1 per cent residual leukocytes. When red blood cells were stored at 4C for longer than one week, glycerolized, and washed without freezing, they had about 2 per cent residual leukocytes and platelets. The washing procedure removed at least 95 per cent of the platelets from nonfrozen and previously frozen red blood cells. (Modified author abstract)

AD-786 253/5GA Reprint
Naval Blood Research Lab Chelsea Mass
ACCUMULATION OF DI-2-ETHYLHEXYL PHTHALATE (DEHP) IN WHOLE BLOOD, PLATELET CONCENTRATES, AND PLATELET-POOR PLASMA,
T. J. Contreras, R. H. Sheibley, and C. R. Valeri. 4 Sep 73, 15p
Revision of report dated 30 Mar 73. See also AD-766 554.
Availability: Pub. in Transfusion, v14 n1 p34-46 Jan/Feb 74.

Descriptors: *Blood, *Phthalates, *Plasticizers, *Polyvinyl chloride, Plastics, Bags, Blood plasma, Blood platelets, Accumulation, Blood banks, Storage, Blood transfusion, Toxicity.
Identifiers: Phthalic acid/bis(ethylhexyl-ester).

The concentration of the plasticizer, di-2-ethylhexyl phthalate (DEHP), in the plasma was measured after storage of the whole blood in polyvinyl chloride plastic bags at 4C for up to 38 days in either ACD or CPD. The plasma from ACD-stored whole blood contained more DEHP than that from CPD-stored whole blood. The continuous-flow centrifugation washing procedures removed about 98 per cent of the DEHP from ACD whole blood stored for 33 days at 4C. DEHP was assayed in the platelet-rich plasma, platelet-poor plasma, supernatant of the platelet concentrate, washed platelets, and washed red blood cells prepared from CPD whole blood. Very little DEHP was found in the washed red blood cells and platelets, a small amount was found in the platelet-poor plasma, and a large amount in the supernatant of the platelet concentrate. A greater amount of DEHP accumulated in the platelet concentrates that were stored at 22C than in those stored at 4C. When platelet concentrates from CPD whole blood were stored at 22C for 72 hours, the amount of DEHP was about four times that observed after 4C storage for the same length of time. (Author)

BARC-701 PC$4.25/MF$2.25
Bhabha Atomic Research Centre, Bombay (India). Electronics Div.
MUSCLE STIMULATOR TYPE OS882.
P. V. Abhyankar, and V. K. Menon. 1973, 25p
U.S. Sales Only.

Descriptors: (*Muscles, *Stimulation), Electric currents, Man.

For abstract, see NSA 30 08, number 23381.

COM-74-50932/4GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.
HEALTH AND MEDICAL FACILITIES DESIGN: PROCEEDINGS OF THE FEDERAL AGENCY WORKSHOP HELD AT THE NATIONAL BUREAU OF STANDARDS, GAITHERSBURG, MARYLAND ON DECEMBER 5, 1972.
Building Science series rept.,
Robert J. Kapsch. Jul 74, 88p NBS-BSS-54
Library of Congress Catalog Card no. 74-10561.
Paper copy available from GPO $1.25 as C13.29/2:54.

Descriptors: *Meetings, *Hospitals, *Architecture, Clinical medicine, Facilities, Design, Buildings, Health.

The Federal Agencies have a large involvement in the area of medical facility design, both in directly operated Federal facilities and indirectly through grant, loan and funding programs. Because of the impact of technology and because of the very large cost for new medical facilities, the last few years there has been the rise of a field best described as medical facility research. These papers, presented at a National Bureau of Statndards' Federal Agency Workshop, described the latest medical facility research efforts by the Federal Agencies including, the Department of Defense, Department of Health, Education and Welfare, the Veteran's Administration and the National Bureau of Standards.

N74-29462/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A DESCRIPTION OF MODEL 3B OF THE MULTIPURPOSE VENTRICULAR ACTUATING SYSTEM.
J. A. Webb, Jr.. Jun 74, 48p NASA-TM-X-71570, E-8009

Descriptors: *Blood circulation, *Cardiac ventricles, Actuators, Heart function, Models, Pneumatic equipment.

For abstract, see STAR 1219

PB-235 026/2GA PC$7.50/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
ENERGY TRANSMISSION THROUGH INTACT SKIN.
Annual rept. Jul 72-Jul 73,
P. M. Newgard, J. R. Woodbury, B. J. Grossi, and T. Hori. Aug 73, 249p NIH/NHLI-67-1422-5
Contract PH-43-67-1422

Descriptors: *Skin(Anatomy), *Energy transfer, *Mechanical hearts, Implantation, Electrically powered instruments, Control equipment, Electric batteries.
Identifiers: Cardiac assist devices, Blood pumps.

The report covers research directed toward the development and application of a technique for transfer of electrical energy into the body in sufficient quantities to operate an implanted artificial heart. Progress was made in reducing the size and weight of components, especially those to be positioned near the heart within the thorax, without loss in overall efficiency. Progress was also made in upgrading the external power system to more nearly represent a truly portable system with increased reliability. A detailed analysis of motor performance was made including the effects of viscosity in submerged operation. Computer programs were developed that make it possible to determine the optimum gear ratio and motor winding voltages, given any combination of system losses, loads, and supply voltage.

PB-235 246/6GA PC$7.50/MF$2.25
Thermo Electron Corp., Waltham, Mass.
STUDY OF THE EFFECTS OF ADDITIONAL ENDOGENOUS HEAT.
Annual progress rept. 13 Jun 72-13 Jun 73,
Fred N. Huffman, and J. C. Norman. Jun 73, 244p TE4064-31-74 PH-43-66-982-7
Contract PH-43-66-982
See also PB-212 952.

Descriptors: *Mechanical hearts, *Heat tolerance, Physiology, Pathology, Radiation effects, Mechanical organs, Heat sinks, Heat transfer, Body temperature, Heat exchangers, Mammals, Radiation effects, Nuclear radiation, Radioactive isotopes, Implantation, Plutonium 238, Heart, Laboratory animals, Bioassay.
Identifiers: *Cardiac assist devices.

The feasibility of implantable circulatory support systems depends on the ability of the body to dissipate the reject heat from the power source driving the blood pump. If the energy source is a radioisotope, the body must also tolerate chronic intracorporeal radiation. The objective of the endogenous heat program is to characterize the effects of intracorporeal nuclear radiation and additional thermal load on mammals. This program is a continuation of initial canine studies using electrical heat exchangers and subsequent efforts utilizing heat exchangers energized by 16- and 24-watt Pu-238 (Plutonium-238) capsules. More recently, the effects of RES (radiation equivalent source)-24 capsules which simulate the neutron and gamma radiation environment from a 24-watt Pu-238 heat source have been evaluated in mongrel dogs. The long-term survivals in good condition of both PU-238 and RES implanted dogs and primates, as well as the STS implantations, are encouraging that the anticipated reject heat and dose rate levels from implantable circulatory support systems may be permissible.

PB-235 251/6GA PC$10.25/MF$2.25
Utah Biomedical Test Lab., Salt Lake City.
ANNUAL REPORT. 1 JULY 1971 THROUGH 30 JUNE 1972,
N. F. deGroot. 30 Aug 72, 386p AR-015-0-DO-003 NIH/NHLI-70-2081-2
Contract PHS-70-2081
See also PB-221 613.

Descriptors: *Mechanical hearts, Mechanical organs, Oxygen transport mechanisms, Monitors, Laboratories, Medical equipment, Cardiovascular system, Bypasses, Research projects.

Identifiers: Intraaortic balloon devices, Cardiac assist devices, Blood pumps.

The annual report is made up of a collection of technical reports on project work performed during the year. Test projects include the Dow capillary membrane oxygenator, a veno-arterial bypass pumping system, the Tecna-Westinghouse intraaortic balloon system, and the Mississippi pump control console. Additional reported work includes design and construction of a patient monitor console and construction of the laboratory building.

PB-235 285/4GA PC$3.25/MF$2.25
Chemico Process Plants Co., El Monte, Calif. Envirogenics Systems.
PRODUCTION OF CELLULOSE ACETATE HEMODIALYSIS MEMBRANE FOR CLINICAL TRIALS.
Final rept. 3 Apr 72-30 Jun 74,
C. W. Saltonstall, Jr. 20 Jun 74, 10p AK-2-72-2205
Contract N01-AM-2-2205

Descriptors: *Artificial kidneys, *Cellulose acetate, *Membranes, Mechanical organs, Specifications, Dialysis, Manufacturing, Patients, Clinical medicine, Bursting strength, Permeability, Quality control, Thickness, Specifications.
Identifiers: *Hemodialysis.

The objective of the program was to determine the reproducibility of manufacture of cellulose acetate hemodialysis membrane and to provide an ample supply for clinical testing at selected dialysis units. Twenty-eight rolls of 16-in. wide membrane (0.0010 to 0.0014-in. thick) were manufactured and all met the specifications for uniformity of thickness freedom from imperfections, burst pressure and hydraulic permeability. Of these, four rolls were shorter than the target 850+50 ft. Sixteen rolls were distributed at the direction of the Project Monitor to various dialysis units.

PB-235 790/3GA PC$3.75/MF$2.25
Gulf South Research Inst., New Orleans, La.
MEMBRANE AND MATERIALS EVALUATION: CUPROPHAN 150-PM ARTIFICIAL KIDNEY REFERENCE MEMBRANE EVALUATION AND EXPERIMENTAL PROCEDURES.
Annual rept. Jun 73-Jun 74,
Elias Klein, James K. Smith, and F. F. Holland, Jr. 29 Jul 74, 38p AK-2-72-2221-A
Contract PHS-72-2221
See also PB-231 655.

Descriptors: *Membranes, *Artificial kidneys, Dialysis, Materials, Permeability, Filtration, Physical properties, Mechanical properties, Cellulose, Experimental data, Evaluation, In vitro analysis.
Identifiers: *Hemodialysis, Ultrafiltration.

A reference lot of Cuprophan 150-PM hemodialysis membrane has been thoroughly characterized as to the following properties; ultrafiltration rate, solute permeabilities from molecular weight 60 to 75,000, physical properties and mechanical properties.

PB-235 791/1GA PC$3.25/MF$2.25
Gulf South Research Inst., New Orleans, La.
MEMBRANE AND MATERIALS EVALUATION: RHONE POULENC POLYACRYLONITRILE MEMBRANE - LABORATORY EVALUATION OF PERMEABILITY, PHYSICAL AND MECHANICAL PROPERTIES.
Annual rept. Jun 73-Jun 74,
Elias Klein, James K. Smith, and F. F. Holland, Jr. 29 Jun 74, 25p AK-2-72-2221-B
Contract PHS-72-2221
See also PB-231 656.

Descriptors: *Polyacrylonitrile, *Membranes, *Artificial kidneys, Dialysis, Materials, Permeability, Mechanical properties, Filtration, Experimental data.
Identifiers: *Hemodialysis, Ultrafiltration.

A sample of polyacrylonitrile hemodialysis membrane manufactured by Rhone Poulenc, Inc., has been throughly characterized under laboratory conditions as to the following properties; ultrafiltration rate, solute permeability from molecular weight 60 to 75,000, physical and mechanical properties.

PB-235 792/9GA PC$3.75/MF$2.25
National Inst. of Scientific Research, Rancho Santa Fe, Calif.
MODIFIED POLYCARBONATE MEMBRANES FOR HEMODIALYSIS.
Annual rept. 1 Jan-31 Jul 73,
William Stone, Jr., Bruce S. Fisher, Paul A. Cantor, and Willard S. Higley. Aug 73, 45p AK-2-70-2100
Contract N01-AM-0-2100
See also PB-225 043.

Descriptors: *Artificial kidneys, *Membranes, *Polycarbonate resins, Dialysis, Permeability, Filtration, Molecular weight, Quality control, Synthesis, Tables(Data), Casting, Polymerization, Performance evaluation, Fabrication.
Identifiers: *Hemodialysis, Blood compatible materials, Ultrafiltration, Biomaterials.

A copolyether-polycarbonate hemodialysis membrane developed during the present contract continues to show great promise. Animal testing with polycarbonate dialysis membrane has been successfully completed. Membrane has been produced in lengths up to 200 lineal feet and up to 16 in. with little end-to-end variation in properties. Process studies are continuing to establish quality control in the synthesis of the basic polycarbonate copolymer as well as in membrane formulation and casting. Control of both the overall molecular weight and the molecular weight distribution of the copolymer has been found essential not only for optimum membrane properties but also for ease of processing of the membrane casting solution.

PB-236 053/5GA PC$4.25/MF$2.25
Virginia Univ., Charlottesville. Research Labs. for the Engineering Sciences.
FITTING OF LOWER EXTREMITY PROSTHETICS.
Final rept. 1 Mar 70-31 Aug 73,
David W. Lewis, and Robert McLaughlin. Jul 73, 62p ME-3247-101-73U SRS-23-55130-001
Grant SRS-23-55130

Descriptors: *Prosthetic devices, *Amputation, *Thermography, Blood circulation, Skin(Anatomy), Temperature, Pressure, Leg(Anatomy), Fittings, Orthopedic equipment, Temperature measuring instruments, Patients, Infrared radiation.

The research was to discover the relationships between pressure and temperature distribution in the stump of amputees and to determine whether measurement of these parameters would be helpful in the fitting of lower extremity prostheses. The use of thermographic studies to predict successful levels of amputations was also explored. Successful thermographic procedures were performed on 43 amputees, and a positive correlation was found between pressure and thermographic findings. Thermography may therefore be used to detect areas of undue pressure and aid in the fitting of prostheses. Except in those cases having cellulitis or skin infection, eventual successful outcome of amputation can be predicted by thermography.

6M. Microbiology:

AD-785 647/9GA PC$3.25/MF$2.25
Walter Reed Army Inst of Research Washington D C
TRANSOVARIAL TRANSMISSION OF CALIFORNIA ENCEPHALITIS BY FLOODWATER MOSQUITOES,
James W. Le Duc, William Suyemoto, Bruce F. Eldridge, and Philip K. Russell. 1973, 9p

Descriptors: *California encephalitis virus, *Culicidae, Maryland, Aedes, Arboviruses, Ecology, Larvae, Viruses, Disease vectors, Antibodies, Laboratory animals, Isolation, Epidemiology.
Identifiers: Mosquitoes, Delmarva region, Aedes atlanticus.

During arbovirus ecology studies on the eastern shore of Maryland, the Keystone strain of California encephalitis was repeatedly isolated from Aedes atlanticus mosquitoes. The field infection rate from this species remained approximately the same, both between years and during each year studies, even during periods when large numbers of adults were emerging. Further, virus was isolated from among the very first adult A. atlanticus collected and tested, thus suggesting that these mosquitoes had emerged infected. To demonstrate the suspected transovarial transmission of this virus, developmental stages of A. atlanticus were collected from the field. Larvae were identified and pooled for virus isolation in suckling mice. Pupae were allowed to emerge in the laboratory, then segregated by sex and pooled for virus isolation.

AD-785 651/1GA PC$3.25/MF$2.25
Army Medical Research Lab Fort Knox Ky
ISOLATION AND PURIFICATION OF HEPATITIS ASSOCIATED ANTIGEN BY ELECTROCHROMATOGRAPHY,
Anthony J. Luzzio. 1974, 16p

Descriptors: *Chromatography, *Hepatitis viruses, *Antigens, Electrophoresis, Immunology, Proteins, Biochemistry, Viruses, Blood serum, Isolation, Purification.
Identifiers: *Electrochromatography, *Australia antigen.

The discovery of Australia antigen (Au) and its association with serum or type B hepatitis has proven to be a major breakthrough in hepatitis research. However, the lack of a simple and economical method for isolation and purification of Au presents a major barrier to research studies in which large amounts of Au reagent are required. Electrochromatography is a new technique which combines the separation principles of electrophoresis and column chromatography. Despite its potential for separation of complex mixtures, the technique has been little used for the separation of proteins or virus particles. A simplified method for the purification of Au by electrochromatography is described which employs a new column that can be used for conventional column chromatography, preparative electrophoresis, and electrochromatography. The apparatus is unique in that it can carry out these procedures individually, in sequence, or in combination, without modification or alteration of the initial system.

AD-785 670/1GA PC$3.25/MF$2.25
Army Natick Labs Mass
NEW QUALITY CONTROL TECHNIQUES FOR THE RAPID DETECTION OF FOODBORNE MICROORGANISMS,
Durwood Rowley, Joseph Previte, Roger Wells, Rauno Lampi, and David Mikelson. 1973, 15p

Descriptors: *Microorganisms, *Bacteria, *Radiometry, *Calorimetry, Food, Contamination, Detection, Quality control, Test methods, Salmonella, Staphylococcus.
Identifiers: *Food contamination.

The potential for the application of radiometry for rapidly estimating the level of microbes in model systems and meat loaf was demonstrated. Initial concentrations of foodborne pathogens (aerobic vegetative cells of Salmonella and Staphylococcus) of 10,000 cells/ml and fewer than 10 cells/ml were detected in model systems by 3-4 hr and 8-9 hr, respectively. The detection time for anaerobic foodborne pathogenic and spoilage cells, originating from spores 100 to 10,000 cells/ml) was about 3

to 4 hr greater than that of comparable numbers of aerobic nongsporeforming vegetative cells. The detection time of the indigenous flora of meat loaf was proportional to the log concentration of microorganisms. Utilizing microcalorimetry, a system was established capable of detecting initial levels of S. aureus of 2 cells/ml TSY in 12-13 hr and 10,000 cells/ml in less than three hr. This technique is not limited to gas producers, and may be applied to packaged foods. Both methods are simple, sensitive, rapid, can be automated and are adaptable to situations where minimally trained personnel must decide whether foods should be accepted, rejected or further tested because of their microbiological quality.

AD-785 702/2GA PC$3.25/MF$2.25
Walter Reed Army Inst of Research Washington D C
MENINGOCOCCAL ANTIGENS: AN IMMUNOCHEMICAL APPROACH TO THE DEVELOPMENT OF A MENINGITIS VACCINE,
Wendell D. Zollinger. 1973, 16p

Descriptors: *Neisseria meningitidis, *Antigens, *Vaccines, *Bacteria, Chemical analysis, Immunology, Proteins, Polysaccharides, Bioassay, Mice, Toxicity, Serology.
Identifiers: *Immunochemistry, Lipopolysaccharides.

The authors isolated the protein and lipopolysaccharide (LPS) components of the meningococcal outer membrane and shown that they are both shared across serogroup lines. Results of specific hemagglutination (HA) assays indicated that persons who acquire systemic meningococcal disease usually develop a substantial increase in antibody titer against both the LPS and the protein antigens. Asymptomatic nasopharyngeal carriers of group B meningococci, however, appeared to respond principally to the protein antigens. The outer membrane protein has been considered to be the best candidate for testing as a potential vaccine against group B meningococci. In preliminary tests in laboratory animals the two trial vaccine lots were found to be nontoxic in mice and guinea pigs, nonpyrogenic in rabbits, protective in mice and capable of inducing bactericidal antibody in rabbits.

AD-785 724/6GA PC$3.75/MF$2.25
Ohio State Univ Research Foundation Columbus
ISOLATION AND CHARACTERIZATION OF PLASMODIAL AND BABESIAL ANTIGENS.
Annual rept. 1 Dec 73-30 Aug 74,
Julius P. Kreier. Aug 74, 37p Rept no. OSURF-3365-3
Contract DADA17-72-C-2072
See also AD-775 854.

Descriptors: *Protozoa, *Antigens, Plasmodium, Parasites, Serology, Electrophoresis, Agglutins, Immunization, Rats, Laboratory animals, Antibodies, Phagocytes.
Identifiers: Host parasite relations, *Plasmodium berghei, *Babesia microti, Complement fixation tests, Latex.

In the past year a neutralization test was developed capable of detecting antimerozoite antibody in the serum of rats recovering from malaria. It has been demonstrated that such serum also contains opsonic antibody which markedly stimulates phagocytosis of merozoites by phagocytes from normal rats but does not contain antibody that stimulates phagocytosis of erythrocytes from infected rats. Also demonstrated is that injection of freeze thawed erythrocytic merozoites protects rats from the effects of challenge with parasitized erythrocytes. By immunization and neutralization procedures it can be determined whether specific antigens associated with erythrocytic merozoites significantly contribute to stimulation of immunity in malarious rats. The ultrasonically freed merozoites were also adapted to studies of erythrocyte penetration in vitro and will thus be able to determine if protective antibodies act by interfering with merozoite penetration as well as by stimulating phagocytosis. A number of serologic tests by complement fixation which showed that serum from animals with Babesia microti infection does not react with Plasmodium berghei antigen. (Modified author abstract)

AD-785 754/3GA Reprint
Johns Hopkins Univ Baltimore Md
'EIMERIA PHOCAE SP. N.' FROM THE HARBOR SEAL ('PHOCA VITULINA CONCOLOR').
Technical rept.,
Chao-Kuang Hsu, Edward C. Melby, Jr., and Norman H. Altman. 9 Jul 73, 7p Rept no. TR-9
Contract N00014-67-A-0163-0010
Availability: Pub. in Jnl. of Parasitology, v60 n3 p399-402 Jun 74.

Descriptors: *Seals(Mammals), *Parasites, *Coccidium, Pathology, Histology, Tissues(Biology), Hosts(Biology), Protozoa.
Identifiers: Eimeria phocae, Phoca vitulina concolor, Host parasite relations.

Oocysts are 43.9 by 26.6 micrometers with micropyle, oocyst residuum, and polar granule. Gametogeny occurs in the colon and to a lesser degree in the distal ileum. The patent period is 11 days. Pathology involves bloody diarrhea, necrotizing hemorrhagic colitis, and death. It is the first protozoan parasite described from the harbor seal. (Author)

AD-785 761/8GA PC$3.25/MF$2.25
Maryland Univ Baltimore Dept of Microbiology
GENETIC STUDIES ON SCRUB TYPHUS AND SPOTTED FEVER RICKETTSIAE.
Final rept. 1 Jul 73-30 Jun 74,
Joseph V. Osterman, Jr. 1 Jul 74, 15p
Contract DADA17-73-C-3145

Descriptors: *Genetics, *Rickettsia tsutsugamushi, Typhus, Nucleic acids, Biosynthesis, Antigens.
Identifiers: *Spotted fever rickettsiae, *Rickettsia conorii.

The research program consists of two interrelated areas of work, both aimed at understanding the genetic basis of variation in scrub typhus organisms. It was felt that a combined program, studying both nucleic acid synthesis and genetics, was the most logical approach to this problem. Once the mechanism of variation was revealed, it might be possible to influence changes in the rickettsiae by chemical mutagenesis and develop strains particularly suitable for vaccine development which contain multiple major surface antigens. (Modified author abstract)

AD-785 781/6GA Reprint
Naval Medical Research Unit No 2 Taipei (Taiwan)
GROUP B ARBOVIRUS ANTIBODIES IN SENTINEL PIGS NEAR JAKARTA, INDONESIA.
Technical rept.,
P. F. D. Van Peenen, S. W. Joseph, Soerota Atmosoedjono, R. Irsiana, and G. Sulianti Saroso. Mar 74, 7p Rept no. NAMRU-2-TR-608
Availability: Pub. in the Southeast Asian Jnl. of Tropical Medicine and Public Health, v5 n1 p1-3 Mar 74.

Descriptors: *Indonesia, *Swine, *Group A arboviruses, *Antibodies, Japanese encephalitis viruses, Viruses, Epidemiology, Serology.

Pigs of local breed were placed as sentinels to detect transmission of group B virus in areas east and west of Jakarta, Indonesia. All pigs had HI antibodies against a Japanese encephalitis virus antigen initially, presumably of maternal origin; and there was evidence of new exposure to virus in July and August, November and December, and at an unknown time during the rainy season in 1971, in Kapuk, Tanggerang, and Bekasi areas, respectively. (Author)

AD-785 860/8GA PC$3.25/MF$2.25
Louisiana State Univ Medical Center New Orleans Dept of Surgery
ANTIBACTERIAL EFFECTS OF HYPERBARIC OXYGEN.
Final rept. 1 May 66-30 Sep 74,
George H. Bornside. 30 Sep 74, 14p
Contract N00014-66-C-0189
See also AD-694 735.

Descriptors: *Bactericides, *Oxygen, High pressure, Bacteria, Growth(Physiology), Inhibition, Antibiotics.
Identifiers: *Hyperbaric oxygenation.

The research was concerned with inhibitory effects of an environment of hyperbaric oxygen on bacterial growth. A portion of the effort was directed to experimental epidemiological studies of the development and transfer of antibiotic-resistant bacteria in gnotobiotic mice. Hyperbaric oxygen (3 atm absolute) was a bactericidal agent for bacteria exposed either in vitro or in vivo. The bactericidal effect was dependent upon the duration and intensity of exposure, and was independent of common taxonomical characteristics of bacteria. Exposure of broth cultures to hyperbaric O2 and an antibiotic enhanced antibiotic activity 3-fold. Significantly less killing occurred when bacteria were exposed to high pressure O2 enriched with CO2. Survival of rats with experimental burn wound sepsis was not enhanced by exposure to hyperbaric O2. However, an in vivo bactericidal effect was demonstrated in the colonic flora of rats breathing 100% O2 at 3 atm. Exposure of susceptible bacteria to an antibiotic (tetracycline or kanamycin) in the intestinal tract of germfree mice monoassociated with either Staphylococcus aureus or Serratia marcescens was accompanied by bacterial mutation to resistance to the specific drug. (Author)

AD-786 053/9GA Reprint
Naval Dental Research Inst Great Lakes Ill
THE DISTRIBUTION OF STREPTOCOCCUS MUTANS ON THE TEETH OF TWO GROUPS OF NAVAL RECRUITS,
I. L. Shklair, H. J. Keene, and P. Cullen. Aug 74, 8p Rept no. NDRI-PR-74-05
Availability: Pub. in Attached Archives of Oral Biology, v19 p199-202 1974.

Descriptors: *Streptococcus, *Teeth, Mutations, Naval personnel, Bacteria, Dental plaque, Dental caries, Dentistry.
Identifiers: Streptococcus mutans.

Plaque samples from clinically sound bucco-lingual, occlusal and approximal surfaces were examined for the presence of Streptococcus mutans. A caries-free (DMFT = 0) and a control group (DMFT = 1-27) were sampled. In the caries-free group, Strep. mutans was isolated from 12.9, 33.6 and 37.1 per cent of bucco-lingual, occlusal and approximal sites respectively. In the control group, the isolation frequency for Strep. mutans was 30.4 per cent for bucco-lingual surfaces, 71.7 per cent for occlusal surfaces and 69.6 percent for approximal surfaces. Strep. mutans was isolated from at least one of the three sites sampled in 92.4 percent of the control group compared to 56.4 per cent of the caries-free subjects. In general, the percentage of Strep. mutans to total streptococci was also higher in the control group than the caries-free group. (Author)

AD-786 145/3GA Reprint
California Univ Berkeley Naval Biomedical Research Lab
LIQUID SCINTILLATION RADIOASSAY IN DISPOSABLE MICROCENTRIFUGE TUBES: RADIOIMMUNE PRECIPITATES AND OTHER APPLICATIONS,
F. L. Schaffer, and M. E. Soergel. 23 Apr 74, 9p
Sponsored in part by Office of Naval Research, Arlington, Va.
Availability: Pub. in Applied Microbiology, v28 n2 p280-287 Aug 74.

Descriptors: *Serology, *Precipitation, Scintillation, Laboratory equipment, Tubes, Disposable equipment, Test methods.
Identifiers: *Radioimmunoassay.

A simple, economical radioassay system employing disposable polypropylene microcentrifuge tubes was developed. Plastic adapters permitted automatic operation in liquid scintillation spectrometers. Counting efficiencies of 3H, 14C, 32P, and 125I in liquid scintillation cocktails and of 32P by Cerenkov radiation (at lower efficiency in absence of added scintillator) were comparable to those in standard vials. Multipurpose use of the microtubes made the system versatile and expedient, e.g., collection of precipitates and radioassay in the same container. Collection of radioimmune precipitates was aided by a carrier inorganic precipitate, $Mg_2P_2O_7$. (Author)

N74-29446/3GA PC$4.00/MF$2.25
Food and Drug Administration, Cincinnati, Ohio.
ECOLOGY AND THERMAL INACTIVATION OF MICROBES IN AND ON INTERPLANETARY SPACE VEHICLE COMPONENTS.
Quarterly Report, 1 Oct. - 31 Dec. 1973.
J. E. Campbell. Feb 74, 7p NASA-CR-138895, QR-35
NASA ORDER W-13411

Descriptors: *Microorganisms, *Spacecraft sterilization, Ecology, Statistical analysis, Temperature effects.

For abstract, see STAR 1219

N74-30477/5GA PC$5.00/MF$2.25
Hardin-Simmons Univ., Abilene, Tex. Dept. of Biology
A STUDY OF PSYCHROPHILIC ORGANISMS ISOLATED FROM THE MANUFACTURE AND ASSEMBLY AREAS OF SPACECRAFT TO BE USED IN THE VIKING MISSION.
Semiannual Progress Report, 1 Jan. - 30 Jun. 1974.
T. L. Foster. Jul 74, 37p NASA-CR-139390, SAPR-4
Contract NGR-44-095-001

Descriptors: *Microorganisms, *Spacecraft configurations, *Spacecraft sterilization, Exobiology, Heat tolerance, Manufacturing, Mars (Planet), Space environment simulation, Viking orbiter spacecraft.

For abstract, see STAR 1220

N74-30479/1GA PC$4.00/MF$2.25
Minnesota Univ., Minneapolis. Dept. of Microbiology.
FLUORESCENT ANTIBODY DETECTION OF MICROORGANISMS IN TERRESTRIAL ENVIRONMENTS.
Final Report, 1 Jul. 1970 - 31 Dec. 1972.
E. L. Schmidt. 31 Dec 72, 5p NASA-CR-139386
Contract NGR-24-005-198

Descriptors: *Antibodies, *Fluorescence, *Microorganisms, *Soil mechanics, Autotrophs, Plant roots, Symbiosis, Trees (Plants).

For abstract, see STAR 1220

N74-30480/9GA PC$4.25/MF$2.25
Food and Drug Administration, Cincinnati, Ohio. Food Research Lab.
ECOLOGY AND THERMAL INACTIVATION OF MICROBES IN AND ON INTERPLANETARY SPACE VEHICLE COMPONENTS.
Quarterly Progress Report, 1 Jan. - 31 Mar. 1974.
J. E. Campbell. Jun 74, 22p NASA-CR-139485, QPR-36
NASA ORDER W-13411

Descriptors: *Electron microscopes, *Exobiology, *Interplanetary spacecraft, *Microorganisms, Bacillus, Heat treatment, Morphology, Photomicrography, Thermal cycling tests.

For abstract, see STAR 1220

PB-235 839/8GA PC$5.25/MF$2.25
Rhode Island Univ., Kingston.
THE EFFECT OF TEMPERATURE AND OXYGEN PRESSURE ON CELLULOSE UTILIZATION BY THERMOPHILIC ORGANISMS.
Completion rept. 1 Jul 72-30 Jun 74,
Stanley M. Barnett, Richard A. Romanelli, and Chester W. Houston. 31 Jul 74, 109p W74-12193, OWRR-A-046-RI(1)
Contract DI-14-31-0001-3540

Descriptors: *Thermophiles, *Cellulose, *Fungi, *Fermentation, Physiological effects, Plants(Botany), Ascomycetes, Fungi, Degradation, Pressure, Oxygen, Temperature, Growth, Wastes, Metabolism, Industrial waste treatment, Water pollution control.
Identifiers: Chaetomium thermophile, Sporotrichum thermophile, Thermoascus aurantiacus, Solid wastes.

Three thermophilic celluloytic fungi, Chaetomium thermophile var. coprophile, Sporotrichum thermophile and Thermoascus aurantiacus were studied to determine the conditions for a high rate of cellulose degradation. Optimum temperatures for the three organisms, T. aurantia cus, S. thermophile and C. thermophile were 48, 40 and 40C respectively. The effect of pressure on cellulose utilization, cell yield, growth rate and optimum growth temperature of the cellulolytic fungi was studied in especially designed pressure vessels. The optimum and limiting growth pressures of these fungi were also determined. The effect of pressure per se on the degree of polymerization was studied in uninoculated medium.

UR-3490-474 PC$4.75/MF$2.25
Rochester Univ., N.Y. School of Medicine and Dentistry.
COMPARATIVE STRUCTURE, CHEMISTRY, AND EVOLUTION OF MYCOPLASMA VIRUSES.
J. Maniloff, and A. Liss. 1973, 34p CONF-730742-1

Descriptors: (*Viruses, *Biological evolution), Chemical composition, Ultrastructural changes.

For abstract, see NSA 30 08, number 23391.

6N. Personnel Selection and Maintenance (Medical)

AD-786 171/9GA Reprint
Armed Forces Inst of Pathology Washington D C
UNSUSPECTED TUMORS IN AIRCRAFT ACCIDENT FATALITIES AS A GUIDE TO EVALUATION OF PHYSICAL-EXAMINATION STANDARDS,
James L. Hansen, and Robert R. McMeekin. 1974, 5p
Availability: Pub. in Aerospace Medicine, v45 n8 p959-962 Aug 74.

Descriptors: *Neoplasms, *Endocrine glands, *Aviation medicine, Aviation accidents, Pilots, Medical examination, Diagnosis(Medicine), Pathology, Tissues(Biology), Histology, Military personnel.
Identifiers: Histopathology.

To determine the effectiveness of physical examinations of military aviators in detecting diseases and conditions in the various body systems, specifically unsuspected tumors, autopsy material from some 5,000 victims of fatal aircraft accidents was studied. The anatomic distribution of these unsuspected tumors was tabulated and revealed that, of 81 victims determined to be crewmembers, 22 (27%) had endocrine tumors and 20 (25%) had tumors of the genitourinary system. Though most of the tumors in the series are generally considered benign, a significant number (29, or 36%) were malignant by a liberal definition of the term. The results indicate that the endocrine system should receive additional attention in flight-physical examinations. They also suggest that a long-range program is needed to obtain further data on military aviation pilots in order to evaluate the effectiveness of periodic physical examinations in detecting diseases or abnormalities. (Modified author abstract)

6O. Pharmacology

AD-785 773/3GA Reprint
Naval Medical Research Unit No 3 Fpo New York 09527
TREATMENT OF 'SALMONELLA PARATYPHI A' OSTEOMYELITIS WITH TRIMETHOPRIM-SULPHAMETHOXAZOLE,
Z. Farid, H. A. Sparks, and A. Hassan. 1973, 6p
Rept no. NAMRU-3-TR-8-74
Availability: Pub. in Jnl. of Tropical Medicine and Hygiene, v76 p91-93 Apr 73.

Descriptors: *Musculoskeletal diseases, *Bacterial diseases, *Chemotherapeutic agents, Salmonella, Infectious diseases, Chemotherapy.
Identifiers: *Salmonella paratyphi, *Osteomyelitis, *Trimethoprim, *Sulfamethoxazole.

There have been several reports of the use of trimethoprimsulphamethoxazole in typhoid and paratyphoid A fevers (Akinkugbe et al., 1968; Farid et al., 1970; Kamat, 1970). Its successful use in the treatment of acute staphylococcal osteomyelitis is described by Craven et al. (1970). This paper describes, for the first time, the successful treatment of Salmonella paratyphi A osteomyelitis with this drug. (Author)

AD-786 269/1GA Reprint
Washington Univ Seattle Dept of Pharmacology
TWO ACTIVE STRUCTURES FOR HEMICHOLINIUM-LIKE ACTION,
B. W. Blase, T. A. Loomis, J. A. Collins, and H. Z. Sommer. 6 Aug 73, 6p AROD-11619.2-L
Grant DAHC19-72-G-0008
Revision of report dated 4 Jun 73.
Availability: Pub. in Toxicology and Applied Pharmacology, v27 p676-679 1974.

Descriptors: *Ammonium compounds, Neuromuscular blocking agents, Toxicology, Pharmacology, Rats, Bioassay, Molecular structure.

The hemiketal structure has been reported as necessary for compounds to exhibit hemicholinium action. This report describes the hemicholinium-like effect of 2 bisquaternary compounds (2-hydroxyethyldimethylammonio derivatives) in which the positively charged nitrogens are connected by either the phenylene diacetyl chain or by the same chain in which the keto groups have been reduced. The former compound (IIIb) exists in a cyclic hemiketal or closed ring form and the latter (IIIb-OH) exists as the straight chain form. Studies on the intact rat anterior tibial nerve muscle preparation show that the compounds produce quantitatively similar effects and that both produce significant hemicholinium-like action. These results indicate that both the straight-chain and the hemiketal forms are active structures for hemicholinium-like action. (Author)

COM-74-11540/3GA Reprint
New York Aquarium, Brooklyn. Osborn Labs. of Marine Sciences.
PHYSIOLOGICALLY ACTIVE SUBSTANCES FROM MARINE SPONGES. II. ANTIMICROBIAL SUBSTANCES PRESENT IN EXTRACTS OF THE SPONGE 'VERONGIA ARCHERI' AND OTHER SPECIES OF THE GENUS 'VERONGIA',
M. F. Stempien, Jr., J. S. Chib, R. F. Nigrelli, and R. A. Mierzwa. 1973, 8p NOAA-74090409

Grant NOAA-1-35263
Pub. in Proceedings of the Marine Technology Society, Food--Drugs from the Sea, 1972 p105-110 1973.

Descriptors: *Porifera, *Antibiotics, *Antiinfectives and antibacterials, *Marine microorganisms, Drugs, Bromine, Caribbean Sea.
Identifiers: Verongia archeri, Sea Grant program.

In the course of investigations of the antimicrobial activity of marine sponges, a number of biologically active, bromine-containing compounds were isolated from two varieties of the Caribbean sponge Verongia archeri, a 'hard variety and a 'soft' variety. By means of IR, UV, NMR, and comparison with an authentic synthetic sample, it was shown that this material was 2-(3,5-dibromo-4-hydroxyphenyl)-acetamide, a substance not previously encountered in nature. Several other bromine-containing antibiotic substances have been isolated. Their structures are at present being elucidated. A comparison of the structures of all of these antibiotic substances shows that they all seem to contain a basic carbon skeleton which can be easily derived from either phenylalanine or tyrosine.

COM-74-11542/9GA Reprint
Scripps Institution of Oceanography, La Jolla, Calif.
ANTIBIOTICS FROM MARINE ORGANISMS OF THE GULF OF CALIFORNIA,
R. J. Andersen, and D. J. Faulkner. 1972, 7p
NOAA-74082203
Grant NOAA-2-35208, PHS-GM-17300
Pub. in Marine Technology Society, Food--Drugs from the Sea Proceedings 1972, p111-115 1972.

Descriptors: *Antibiotics, *Marine microorganisms, *Algae, *Porifera, *Tunicata, Marine biology, Aquatic animals, Antiinfectives and antibacterials, California Gulf.
Identifiers: Verongia thiona, Dictyota flabellata, Polyandrocarpa.

During two recent cruises to the Gulf of California aboard R/V Dolphin, the authors screened a variety of marine organisms for antibacterial and antiyeast properties. A total of twenty-five species of sponges, ten species of algae and eight species of tunicates was screened. The results of the screening show suprisingly few active organisms when compared with the results of other workers. Active fractions from two sponges, one alga and a colonial tunicate were found. The authors believe that this is the first report of antibacterial activity from a tunicate. The sponges are both species of Verongia; one has been identified as Verongia thiona, the other has not been identified and may be an undescribed species. The alga has been identified as Dictyota flabellata. The tunicate has been tentatively identified as a species of Polyandrocarpa.

CONF-740708-37 PC$4.25/MF$2.25
CEA, 91 - Orsay (France). Service Hospitalier Frederic Joliot; University Coll. Hospital Medical School, London (UK).
METHOD FOR INVESTIGATION REGIONAL VARIATIONS OF THE CEREBRAL UPTAKE RATE OF EXP 11 C LABELLED PSYCHOTROPIC DRUGS IN MAN.
C. Raynaud, A. E. Todd-Pokropek, D. Comar, S. M. Pizer, and A. Kacperek. 1974, 22p SM-185/84
U.S. Sales Only.

Descriptors: (*Psychotropic drugs, *Tissue distribution), (*Brain, *Scintiscanning), Carbon 11, Gamma cameras, Labelled compounds, Metabolism, Patients, Tracer techniques, Uptake.

For abstract, see NSA 30 08, number 21468.

CONF-740708-58 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.; Oak Ridge Associated Universities, Inc., Tenn. Medical Div.
RADIOPHARMACEUTICALS FOR FUNCTION STUDIES: PRESENT AND FUTURE.
J. K. Poggenburg, and R. L. Hayes. 1974, 14p SM-185/62

Descriptors: (*Radiopharmaceuticals, *Diagnostic techniques), Carbon 11, Computer calculations, Data processing, Iodine 123, Labelled compounds, Nitrogen 13, Nuclear medicine, Organs, Oxygen 15, Patients, Physiology, Positron cameras, Potassium 43, Radionuclide administration, Radionuclide kinetics, Ruthenium 97, Scintiscanning.

For abstract, see NSA 30 08, number 21480.

N74-30473/4GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
TREATMENT OF SYSTEMIC LUPUS ERYTHEMATOSUS WITH AZATHIOPRINE.
E. Sharon. Aug 74, 7p NASA-TT-F-15840
Contract NASW-2481
Tran-Transl. Into English from Harefuah (Tel Aviv), V. 86, No. 7, 1974 p 382-384.

Descriptors: *Clinical medicine, *Drugs, *Lesions, *Skin (Anatomy), Fever, Kidneys, Patients, Signs and symptoms.

For abstract, see STAR 1220

6P. Physiology

AD-785 821/0GA Reprint
University Coll London (England) Dept of Biophysics
NEUROTROPHIC CONTROL OF CONTRACTURE IN SLOW MUSCLE FIBRES.
Interim rept.,
R. Elul, R. Miledi, and E. Stefani. 27 Feb 68, 6p
AFOSR-TR-74-1477
Contract F61052-67-C-0021
Availability: Pub. in Nature, v217 n5135 p1274-1275, 30 Mar 68.

Descriptors: *Neuromuscular transmission, *Contraction, *Muscles, *Nerve impulses, Physiology, Nervous system.

These findings are presented which indicate that nerves are not limited simply to relaying electrical signals to the muscles but also exert a direct influence which controls the characteristics of the contracture. Neural control is not dependent on nerve muscle impulses. It may be that there are Ca receptors on the muscle fiber membrane and the number of receptors is controlled by a substance released by the nerve. (Author)

AD-785 832/7GA Reprint
Honeywell Inc Minneapolis Minn
COMPUTER ANALYSIS OF THE ELECTROENCEPHALOGRAM: EVOKING, PROMOTING, AND PROVOKING,
Donald I. Tepas. 1974, 18p AFOSR-TR-74-1457
Contracts AF-49(638)-1606, AF-08(635)-3627
Presented at the Annual Meeting of the National Conference on the Use of On-Line Computers in Psychology (3rd). Sponsored in part by National Inst. of Mental of Health, Rockville, Md., grant PHS-MH-14020. Prepared in cooperation with Saint Louis Univ., Mo.
Availability: Pub. in Behavior Research Methods and Instrumentation, v6 n2 p95-110 1974.

Descriptors: *Electroencephalography, Digital computers, Electrophysiology, Psychophysiology, Analyzers.
Identifiers: Computer aided analysis, Neurophysiology.

Having a long history of applying analog processing techniques to their data, electroencephalographers were among the first to use the digital computer in the laboratory. Methodological and terminological lessons learned from these applications are discussed in terms of their significance for the psychophysiologist in specific and the psychological laboratory in general. (Author)

AD-786 255/0GA Reprint
Naval Blood Research Lab Chelsea Mass
FACTORS INFLUENCING THE 24-HOUR POSTTRANSFUSION SURVIVAL AND THE OXYGEN TRANSPORT FUNCTION OF PREVIOUSLY FROZEN RED CELLS PRESERVED WITH 40 PER CENT W/V GLYCEROL AND FROZEN AT -80C,
C. Robert Valeri. 15 Aug 73, 17p
Revision of report dated 9 Apr 73.
Availability: Pub. in Transfusion, v14 n1 p1-15 Jan/Feb 74.

Descriptors: *Blood preservation, *Blood transfusion, *Erythrocytes, Survival, Physiology, Freezing, Glycerols, Anticoagulants, Oxygen.
Identifiers: *Oxygen transport mechanisms, Citrate phosphate dextrose.

A 6.2 M glycerol solution was added directly to concentrated red blood cells before storage at -80C for at least two and one-half years. The glycerol was removed from the thawed red blood cells by one of four different washing procedures, and the washed cells were stored at 4C for an additional 24 hours before transfusion. Recovery in vitro was about 90 per cent, and the posttransfusion survival was about 85 per cent. The citrate-phosphate-dextrose (CPD) anticoagulant maintained the oxygen transport much better than acid-citrate-dextrose (ACD) during storage of the red blood cells at 4C for one week prior to freezing. Results were similar whether glycerolized red blood cells were washed in reusable stainless steel bowls, disposable polycarbonate bowls, or collapsible disposable polyvinylchloride plastic bags. (Modified author abstract)

N74-30461/9GA PC$4.25/MF$2.25
California Univ., Davis. Dept. of Animal and Human Physiology.
CORRELATION OF HIPPOCAMPAL THETA RHYTHM WITH CHANGES IN CUTANEOUS TEMPERATURE.
J. M. Horowitz, M. A. Saleh, and R. D. Karem.
1974, 25p NASA-CR-139527
Contracts NGR-05-004-099, NGL-05-004-031

Descriptors: *Alertness, *Hippocampus, *Neural nets, *Thermoregulation, Bioelectric potential, Cats, Electroencephalography, Physiological responses, Rabbits.

For abstract, see STAR 1220

N74-30462/7GA PC$4.50/MF$2.25
California Univ., Davis. Dept. of Human and Animal Physiology.
CORRELATION OF THE HIPPOCAMPAL THETA RHYTHM TO CHANGES IN HYPOTHALAMIC TEMPERATURE.
Final Technical Report.
M. A. Saleh, J. M. Horowitz, and A. C. L. Hsieh.
1974, 26p NASA-CR-139526
Contracts NGL-05-004-099, NGL-05-004-031

Descriptors: *Biological effects, *Body temperature, *Hippocampus, *Hypothalamus, *Rabbits, Alertness, Rhythm (Biology), Thermoregulation.

For abstract, see STAR 1220

N74-30468/4GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
MEAN LUNG CAPACITY UNDER INCREASED O2 DEMAND.
E. Asmussen, and E. H. Christensen. Aug 74, 12p
NASA-TT-F-15598
Contract NASW-2481
Tran-Transl. Into English from Skand. Arch. Physiol., (Denmark), V. 82, 1939 p 201-212.

Descriptors: *Atmospheric pressure, *Oxygen metabolism, *Physical exercise, *Pressure reduction, *Respiration, Capacity, Lungs, Physiological responses, Rest.

For abstract, see STAR 1220

N74-30469/2GA PC$4.00/MF$2.25
Linguistic Systems, Inc., Cambridge, Mass.
THE INFLUENCE OF A ZERO-CALORIE DIET ON CARDIAC PERFORMANCE IN OVERWEIGHT WOMEN WITH NORMAL CIRCULATORY SYSTEMS.
K. Bolzano, H. J. Lisch, A. Aigner, F. Sandhofer, and S. Sailer. Jun 74, 17p NASA-TT-F-15711
Contract NASW-2482
Tran-Transl. Into English from Wien. Klin. Wochenschr. (Austria), V. 85, Oct. 1973 p 667-661.

Descriptors: *Diets, *Females, *Heart function, Body weight, Cardiovascular system, Circulatory system, Heart diseases, Heart rate.

For abstract, see STAR 1220

N74-30472/6GA PC$4.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
RESPIRATORY AND RIGHT HEART FUNCTION IN DIFFERENT TYPES OF OBESE PATIENTS.
J. Meunier-carus, E. Lampert, J. Lonsdorfer, D. Kurtz, and G. Micheletti. Aug 74, 30p NASA-TT-F-15827
Contract NASW-2483
Tran-Transl. Into English from Bull. Physio-Pat-Hol. Resp. (France), V. 8, 1972 p 915-935.

Descriptors: *Heart function, *Obesity, *Respiration, Hemodynamics, Hyperventilation, Pathological effects, Physiological responses, Respiratory system.

For abstract, see STAR 1220

ORO-4245-1 PC$4.00/MF$2.25
Tennessee Univ., Knoxville.
STUDIES ON NUTRITION OF THE PREPLACENTAL EMBRYOS OF THE MAMMAL. FINAL REPORT.
J. C. Jr. Daniel. 1974, 6p
Contract AT(40-1)-4245

Descriptors: (*Embryos, *Nutrition), Body fluids, Lipids, Marsupials, Nucleic acids, Particles, Pregnancy, Proteins, Rabbits, Rna, Uterus, Viruses.

For abstract, see NSA 30 08, number 23385.

UR-3490-501 PC$7.25/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
TRANSMURAL TRANSPORT OF CA EXP 2+ , HPO SUB 42- , AND K EXP + IN EMBRYONIC CHICK CALVARIA.
P. J. Scarpace. 1974, 82p
Contract AT(11-1)-3490

Descriptors: (*Calcium compounds, *Tissue distribution), (*Phosphates, Tissue distribution), (*Potassium compounds, Tissue distribution), Bone tissues, Cations, Chickens, Diffusion, Embryos, Kinetics, Membranes.

For abstract, see NSA 30 08, number 23392.

UR-3490-515 PC$4.00/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
USE OF FROZEN SECTIONS IN THE ANALYSIS OF BONE.
J. R. Coleman, P. Batt, P. Moran, and R. R. Warner. 6p CONF-740717-1

Descriptors: (*Bone tissues, *Chemical analysis), Freezing, Minerals, Sample preparation.

For abstract, see NSA 30 08, number 23394.

6Q. Protective Equipment

AD-785 601/6GA PC$3.25/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
NEW MATERIALS AND CONSTRUCTION FOR IMPROVED HELMETS.
Alan L. Alesi, Richard P. Ames, Roger A. Gagne, Alan M. Litman, and Joseph J. Prifti. 1974, 16p

Descriptors: *Helmets, *Military applications, Materials, Polypropylene, Films, Glass textiles, Polyamide plastics, Protection, Terminal ballistics.

Three new materials are now simultaneously available for exploitation in personnel armor. They are (1) XP, a highly oriented polypropylene film, (2) LMLD - a low modulus, low density glass fiber, and (3) Kevlar - a high modulus, high strength aromatic polyamide fiber. All three are superior to the older armor materials in protection capabilities against munition fragments. The paper considers only the XP and Kevlar materials and some problems posed by their 'newness' and unusual characteristics in their application to helmets. The preparation of flat laminates and helmet constructions and their testing in several ways for 'durability' and for fragment penetration resistance capabilities are presented. The suitability of these materials and constructions for helmets are evaluated.

6R. Radiobiology

AD-785 609/9GA PC$3.25/MF$2.25
Joint Amrdc-Amc Laser Safety Team Philadelphia Pa
OCULAR AND SKIN HAZARDS FROM CO2 LASER RADIATION,
Arnold S. Brownell, and Bruce E. Stuck. 1972, 16p

Descriptors: *Carbon dioxide lasers, *Radiation effects, *Laser hazards, *Health physics, Radiobiology, Gas lasers, Mathematical models, Cornea, Skin(Anatomy), Eye, Radiation dosage, Threshold effects, Response(Biology), Laboratory animals, Damage, Experimental data.

The purpose of the paper is threefold: First, to provide data necessary for military and civilian safety communities by presenting experimentally determined threshold doses, from two independent studies, for the minimal detectable changes in cornea and skin following exposure to CO2 laser radiation. Second, to test the validity of a mathematical model in predicting damage thresholds. Third, to determine the extent this model accounts for differences in the experimentally determined dose-response relationships for the two tissues studied.

AD-785 703/0GA PC$3.25/MF$2.25
Joint Amrdc-Amc Laser Safety Team Philadelphia Pa
DISRUPTION OF VISUAL FUNCTION ASSOCIATED WITH LASER ENVIRONMENTS,
Harry Zwick, Gerald C. Holst, and Kenneth Bloom. 1973, 15p

Descriptors: *Laser hazards, *Visual acuity, *Radiation effects, *Health physics, Damage, Morphology(Biology), Eye, Laser beams, Rhesus monkeys, Radiobiology, Laboratory animals, Exposure(Physiology), Experimental data, Irradiation.

The rapid deployment of various kinds of operational laser systems has made it essential to determine the ocular hazards associated with such systems. Biological research concerned with this problem has been restricted almost totally to the determination of macro and micro structural changes on ocular tissue associated with laser irradiation. The principal goal of the research program has been to detail some of the hazardous effects of laser irradiation on visual function. In the paper methodology is reviewed and recent results are presented.

AD-785 739/4GA PC$4.75/MF$2.25
Virginia Commonwealth Univ Richmond Dept of Biophysics
EFFECTS OF LOW INTENSITY MICROWAVE RADIATION ON MAMMALIAN SERUM PROTEINS.
Annual summary rept. no. 2, Jul 73-Jun 74,
Stephen F. Cleary. Jun 74, 83p*
Contract DADA17-72-C-2144
See also report dated Jun 73, AD-777 019.

Descriptors: *Radiation effects, *Proteins, Blood serum, Microwaves, Blood chemistry, Pathology, Sleep, Experimental data, Kidney diseases, Tissues(Biology), Rabbits, Low intensity.
Identifiers: *Microwave radiobiology.

The effect of 1.7 GHz cw microwave radiation on rabbit serum proteins and blood chemistry were investigated. Intensities of 5 to 25 mW/sq cm for periods of up to two hours were employed in this study. Acrylamide gel electrophoresis was used to compare thermally treated serum proteins with microwave treated samples. Mechanisms for the alteration in drug-induced sleeping time in the Dutch rabbit exposed to 1.7 GHz microwave radiation are discussed. In vitro studies of the thermal denaturation of proteins are described. (Author)

BNWL-SA-4879 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
ENVIRONMENTAL BEHAVIOR AND RADIATION DOSES FROM IODINE-129.
J. K. Soldat. Jun 74, 27p CONF-740702-6
Contract AT(45-1)-1830

Descriptors: (*Iodine 129, *Radioecological concentration), (*Man, *Radionuclide kinetics), (*Thyroid, *Radiation doses), Adolescents, Adults, Children, Environment, Food chains, Infants, Internal irradiation, Radionuclide migration, Uptake.

For abstract, see NSA 30 08, number 21405.

BNWL-SA-4925 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
STUDIES OF PULMONARY CARCINOGENESIS IN RODENTS FOLLOWING INHALATION OF TRANSURANIC COMPOUNDS.
C. L. Sanders, and G. E. Dagle. 18p CONF-740648-3
Contract AT(45-1)-1830

Descriptors: (*Plutonium 238, *Inhalation), (*Plutonium 239, Inhalation), (*Curium 244, Inhalation), (*Respiratory system, *Neoplasms), Alpha sources, Biological radiation effects, Carcinogenesis, Chronic irradiation, Curium oxides, Dose rates, Dose-response relationships, Internal irradiation, Intratracheal administration, Low dose irradiation, Lung clearance, Lungs, Microspheres, Pathological changes, Plutonium oxides, Radiation dose distributions, Radiation doses, Radioinduction, Rats, Retention, Uptake.

For abstract, see NSA 30 08, number 21407.

BNWL-SA-5027 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
RADIATION SENSITIVITY DURING THE CELL CYCLE.
W. C. Roesch. 25 Jun 74, 4p CONF-740715-4
Contract AT(45-1)-1830

Descriptors: (*Animal cells, *Radiosensitivity), (*Urea, *Biological effects), (*Hydroxy com-

pounds, Biological effects), Biological models, Biological radiation effects, Cell cultures, Cell cycle, Equations, Hamsters, Mitosis, Radiosensitivity effects, Survival curves, X radiation.

For abstract, see NSA 30 08, number 21342.

BNWL-SA-5042 PC$4.25/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
EFFECTS OF INHALED URANIUM MINE AIR CONTAMINANTS IN BEAGLE DOGS.
B. O. Stuart, R. E. Filipy, R. F. Palmer, H. A. Ragan, and P. L. Hackett. 21p CONF-740648-2
Contract AT(45-1)-1830

Descriptors: (*Beagles, *Biological radiation effects), (*Dusts, *Biological effects), (*Tobacco smokes, Biological effects), (*Respiratory system, *Pathological changes), Air pollution, Animal cells, Daughter products, Epithelium, Fibrosis, Inhalation, Lungs, Microscopy, Mines, Morphological changes, Radon, Respiration, Synergism, Uranium ores.

For abstract, see NSA 30 08, number 21424.

BNWL-SA-5049 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
CARCINOGENICITY OF INHALED RADIONUCLIDES.
W. J. Bair. 11p CONF-740702-4
Contract AT(45-1)-1830

Descriptors: (*Biological radiation effects, *Dose-response relationships), (*Respiratory system, *Neoplasms), (*Plutonium 238, *Radioactive aerosols), Alpha sources, Beta sources, Carcinogenesis, Chronic irradiation, Dose rates, Etiology, Gamma sources, Inhalation, Internal irradiation, Low dose irradiation, Lung clearance, Mammals, Plutonium oxides, Plutonium 239, Polonium 210, Radiation doses, Radioinduction, Radioisotopes, Radionuclide kinetics, Retention, Ruthenium 106, Time dependence, Tissue distribution, Uptake.

For abstract, see NSA 30 08, number 21408.

CH-3607 PC$4.50/MF$2.25
Argonne National Lab., Ill.
DISTRIBUTION AND EXCRETION OF PLUTONIUM IN TWO HUMAN SUBJECTS.
E. R. Russell, and J. J. Nickson. 2 Oct 46, 26p
Contract W-31-109-eng-38

Descriptors: (*Plutonium 239, *Excretion), (*Man, *Radionuclide kinetics), Citrates, Feces, Intravenous injection, Time dependence, Tissue distribution, Urine.

For abstract, see NSA 30 08, number 21414.

CH-3713 PC$5.75/MF$2.25
Chicago Univ., Ill.
TRANSMISSION OF RADIO-STRONTIUM AND PLUTONIUM FROM MOTHER TO OFFSPRING IN LABORATORY ANIMALS.
M. P. Finkle. 28 Jan 47, 52p
Contract W-31-109-eng-37

Descriptors: (*Strontium 89, *Biological radiation effects), (*Plutonium, Biological radiation effects), (*Mice, Biological radiation effects), (*Rats, Biological radiation effects), Anemias, Comparative evaluations, Congenital malformations, Embryos, Fetal membranes, Fetuses, Growth, Infants, Internal irradiation, Milk, Osteosarcomas, Pathological changes, Perinatal irradiation, Pregnancy, Prenatal irradiation, Radionuclide administration, Radionuclide kinetics, Skeleton.

For abstract, see NSA 30 08, number 21409.

CN-2383 PC$4.25/MF$2.25
Chicago Univ., Ill.
METABOLISM OF PRODUCT FOR PERIOD ENDING OCTOBER 15, 1944.
J. G. Hamilton. 23 Nov 44, 22p

Descriptors: (*Plutonium, *Retention), (*Lungs, *Radionuclide kinetics), (*Skeleton, Radionuclide kinetics), Biological half-life, Chemical state, Intramuscular injection, Intratracheal administration, Intravenous injection, Metabolism, Oral administration, Rats, Subcutaneous injection, Tissue distribution, Valence, Variations.

For abstract, see NSA 30 08, number 21425.

CN-2546 PC$4.50/MF$2.25
Chicago Univ., Ill.
MONTHLY HEALTH REPORT ON PROBLEMS RELATING TO PRODUCT FOR PERIOD ENDING DECEMBER 31, 1944.
9 Jan 45, 28p
Contract W-7401-eng-37

Descriptors: (*Plutonium, *Tissue distribution), (*Mice, *Radionuclide kinetics), (*Rats, Radionuclide kinetics), Autoradiography, Blood, Bone marrow, Bone tissues, Chemical composition, Combustion, Comparative evaluations, Histology, Inhalation, Internal irradiation, Intravenous injection, Kidneys, Liver, Pathological changes, Plutonium nitrates, Plutonium oxides, Radiation doses, Radium, Smokes, Spleen, Toxicity.

For abstract, see NSA 30 08, number 21426.

CN-2653 PC$4.25/MF$2.25
Chicago Univ., Ill.
MONTHLY HEALTH REPORT ON PROBLEMS RELATED TO PRODUCT FOR PERIOD ENDING JANUARY 15, 1945.
8 Feb 45, 24p
Contract W-7401-eng-37

Descriptors: (*Plutonium, *Toxicity), (*Dogs, *Biological radiation effects), Biological effects, Bone tissues, Comparative evaluations, Intravenous injection, Lethal irradiation, Mortality, Pathological changes, Plutonium nitrates, Radiation syndrome, Retention, Time dependence, Tissue distribution, X radiation.

For abstract, see NSA 30 08, number 21410.

CONF-740708-56 PC$4.00/MF$2.25
Oak Ridge Associated Universities, Inc., Tenn. Medical Div.
MEASUREMENT OF TEMPORAL CHANGES IN WHOLE-BODY RADIONUCLIDE DISTRIBUTION WITH A PROFILE SCANNER.
W. D. Gibbs, C. L. Edwards, H. D. Hodges, and R. J. Cloutier. 1974, 19p SM-185/63

Descriptors: (*Radioisotope scanning, *Whole-body counting), (*Patients, *Radionuclide kinetics), Computer calculations, Data processing, Diagnostic techniques, Digital systems, Nuclear medicine, Radionuclide administration.

For abstract, see NSA 30 08, number 21479.

CONF-740715-3 PC$4.50/MF$2.25
Argonne National Lab., Ill.
RISK OF MALIGNANCY FROM INTERNALLY-DEPOSITED RADIOISOTOPES.
R. E. Rowland. 1973, 30p

Descriptors: (*Radium 224, *Carcinogenesis), (*Radium 226, Carcinogenesis), (*Radium 228, Carcinogenesis), (*Neoplasms, *Radioinduction), Biological radiation effects, Chronic irradiation, Dose-response relationships, Injection, Internal irradiation, Pathological changes, Patients, Radiation doses, Radiotherapy, Retention, Skeleton, Thorotrast.

For abstract, see NSA 30 08, number 21406.

CONF-740715-6 PC$4.25/MF$2.25
Oak Ridge National Lab., Tenn.
USE OF CHROMOSOME ABERRATIONS FOR PREDICTING GENETIC HAZARDS TO MAN.
J. G. Brewen, and R. J. Preston. 1974, 25p

Descriptors: (*Genetic radiation effects, *Reviews), (*Chromosomal aberrations, *Radioinduction), (*Leukocytes, Chromosomal aberrations), (*Spermatogonia, Chromosomal aberrations), Biological recovery, Dicentric chromosomes, Genetics, Hazards, Man, Mice, Radiation injuries, X radiation.

For abstract, see NSA 30 08, number 21381.

COO-3167-106 PC$4.50/MF$2.25
New York State Veterinary Coll., Ithaca Dept. of Physical Biology.
BIOLOGICAL EFFECTS OF NUCLEAR POWER SOURCES FOR ARTIFICIAL HEART DEVICES. ANNUAL PROGRESS REPORT, JUNE 1, 1973–MAY 31, 1974.
F. A. Kallfelz, C. L. Comar, and A. P. Casarett. 1974, 30p
Contract AT(11-1)-3167

Descriptors: (*Mechanical heart, Radioisotope heat sources), (*Radioisotope heat sources, *Biological radiation effects), (*Plutonium 238, Biological radiation effects), Artificial organs, Chronic irradiation, Dogs, Internal irradiation, Radiation doses, Simulators.

For abstract, see NSA 30 08, number 21411.

FRNC-TH-469 PC$10.25/MF$2.25
Grenoble-1 Univ., 38 (France).
RESEARCH ON ROOT ABSORPTION AND THE MIGRATION OF EXP 24 NA LABELED SODIUM IN WHEAT AND BARLEY. EFFECTS ON GROWTH AND MINERAL COMPOSITION OF WHOLE YOUNG PLANTS.
A. J. El Dahhak. 1972, 142p
In French. U.S. Sales Only.

Descriptors: (*Wheat, *Radionuclide kinetics), (*Barley, Radionuclide kinetics), (*Sodium 24, *Root absorption), Plant growth, Sodium, Tracer techniques.

For abstract, see NSA 30 08, number 21438.

JPRS-62462 PC$4.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
EFFECT ON NON-IONIZING ELECTROMAGNETIC RADIATIONS.
12 Jul 74, 52p
Trans. of Ukrayinskyi Biokhimichnyi Zhurnal (USSR) n4 p483-6 72; n3 p356-61 73; Fiziologichnyi Zhurnal (USSR) v19 n3 p388-95, 73; Zhurnal Nevropatologii i Psikhiatrii (USSR) v73 p216-20, 73; Voprosy Kurortologii i Lechebnoi Fizicheskoi Kultury (USSR) n3 p222-7, 73; Vrachebnoe Delo (USSR) n7 p12-4, 73; Nauchnye Doklady Vysshei Shkoly. Biologicheskie Nauki (USSR) n3 p58-60, 71.

Descriptors: *Radiobiology, *Radiation effects, *Electromagnetic radiation, *Health physics, Clinical medicine, Blood, Metabolism, USSR, Translations, Joints(Anatomy), Physiological effects.

Contents:
- Changes in metabolism of nitrogenous substances in animal nerve tissue subjected to an electromagnetic field of ultrahigh frequency;
- The effects of low frequency electromagnetic field pulses on skeletal muscle metabolism in the rat;
- Absorption of radiophosphorus across the synovial membrane of the knee joint under the influence of sinusoidal modulated current pulses;

The problem of correlating biochemical data to the condition of the neuromuscular apparatus of parkinsonism patients subjected to decimeter wave therapy;
The biological action of ultrasonic sound and super high-frequency electromagnetic fields in the three-centimeter range;
The effect of brief exposure to a magnetic field on the blood sedimentation rate in health and disease.

N-2024 PC$4.00/MF$2.25
Chicago Univ., Ill.
MONTHLY SUMMARY.
J. J. Nickson. 18 Jun 45, 12p

Descriptors: (*Plutonium, *Radiation monitoring), (*Urine, *Radioactivity), (*Man, *Radionuclide kinetics), Alpha sources, Excretion, Personnel, Personnel monitoring, Radiometric analysis, Sample preparation, Sampling, Uptake, Injection, Renal clearance, Time dependence.

For abstract, see NSA 30 08, number 21417.

N-2273 PC$4.00/MF$2.25
Chicago Univ., Ill.
BIOCHEMISTRY SURVEY SECTION REPORT FOR THE MONTH MAY 1946.
J. J. Nickson. 20 May 46, 6p

Descriptors: (*Personnel, *Radiation monitoring), (*Plutonium, Radiation monitoring), (*Dogs, *Radionuclide kinetics), Abundance, Air pollution, Body, Excretion, Feces, Inhalation, Lung clearance, Lungs, Radiometric analysis, Retention, Sampling, Time dependence, Tissue distribution, Urine, Citrates, Diet, Injection, Lead, Oral administration, Removal, Solutions, Testing, Therapy, Zirconium.

For abstract, see NSA 30 08, number 21418.

N-2302 PC$4.00/MF$2.25
Chicago Univ., Ill.
BIOCHEMISTRY SURVEY SECTION REPORT FOR THE MONTH JUNE 1946.
E. R. Russell. 20 Jun 46, 11p

Descriptors: (*Personnel, *Radiation monitoring), (*Plutonium, *Excretion), Air pollution, Feces, Inhalation, Lung clearance, Radiometric analysis, Radionuclide kinetics, Sampling, Body, Citrates, Intraperitoneal injection, Rats, Removal, Testing, Therapy, Zirconium, Biological half-life, Ingestion, Intestinal absorption, Intestines, Time dependence, Urine.

For abstract, see NSA 30 08, number 21419.

NERC-LV-539-33 PC$4.00/MF$2.25
National Environmental Research Center, Las Vegas, Nev.
RETENTION OF ELEMENTAL AND PARTICULATE RADIOIODINE ON ALFALFA.
B. J. Mason, K. W. Brown, H. W. Hop, and J. C. McFarlane. Jul 74, 19p
Contract AT(26-1)-539

Descriptors: (*Iodine 131, *Retention), (*Alfalfa, *Contamination), Deposition, Detergents, Particle size, Plants.

For abstract, see NSA 30 08, number 21439.

SAN-410-173 PC$4.00/MF$2.25
Scripps Clinic and Research Foundation, La Jolla, Calif. Dept. of Experimental Pathology.
BASIC STUDIES OF THE IMMUNE RESPONSE AND THE EFFECTS OF RADIATION ON THE RESPONSE. PROGRESS REPORT, JULY 1, 1973–JUNE 30, 1974.
F. J. Dixon. 28 Jun 74, 10p
Contract AT(04-3)-410

Descriptors: (*Immune reactions, *Biological radiation effects), (*Animal cells, Biological radiation effects), Immunosuppression, In vitro, Lethal irradiation, Mice, Thymus cells, Thyroid, Viruses.

For abstract, see NSA 30 08, number 21382.

SZS-158 PC$4.25/MF$2.25
Staatliche Zentrale fuer Strahlenschutz, Berlin (German Democratic Republic).
TASKS OF MEDICAL SUPERVISORS OF RADIATION WORKERS.
W. Schuettmann, D. Arndt, W. Koenig, and J. Wagner. Apr 74, 24p
In German. U.S. Sales Only.

Descriptors: (*German democratic republic, *Radiation protection), (*Personnel, Radiation protection), Industrial medicine, Medical personnel, Nuclear facilities.

For abstract, see NSA 30 08, number 21359.

SZS-160 PC$5.75/MF$2.25
Staatliche Zentrale fuer Strahlenschutz, Berlin (German Democratic Republic).
STATE AND TENDENCIES OF CHEMICAL PROTECTION AGAINST IONIZING RADIATION. A LITERATURE SURVEY 1972.
G. Siegel, E. Tapp, H. Fischer, J. Haehn, and R. Dlaske. May 74, 54p
In German. U.S. Sales Only.

Descriptors: (*Radioprotective substances, *Biochemistry), Biological radiation effects, Drugs, In vitro, In vivo, Ionizing radiations, Radiation protection, Radiosensitivity effects, Reviews.

For abstract, see NSA 30 08, number 21360.

UCD-34P187X2 PC$4.50/MF$2.25
California Univ., Davis.
HEMATOPOIETIC REPOPULATION FOLLOWING IRRADIATION INJURY. PROGRESS REPORT, SEPTEMBER 1, 1973–JUNE 1, 1974.
J. P. Lewis, and L. F. O'Grady. 1974, 29p
Contract AT(04-3)-34

Descriptors: (*Blood formation, *Biological recovery), (*Blood cells, *Biological radiation effects), (*Hematopoietic system, *Radiation injuries), Blood platelets, Cell cultures, Dose-response relationships, Erythropoietin, Leukocytes, Mice, X radiation.

For abstract, see NSA 30 08, number 21383.

UCLA-34-P-102-52 PC$4.00/MF$2.25
California Univ., Los Angeles Dept. of Chemistry.
ISOTOPIC STUDIES ON STRUCTURE–FUNCTION RELATIONSHIPS OF NUCLEIC ACIDS AND ENZYMES. PROGRESS REPORT, MAY 1, 1973–APRIL 15, 1974.
P. D. Boyer. 1974, 7p
Contract AT(04-3)-34

Descriptors: (*Nucleic acids, *Biochemical reaction kinetics), (*Enzymes, Biochemical reaction kinetics), Animals, Biosynthesis, Radioisotopes, Tissues, Tracer techniques.

For abstract, see NSA 30 08, number 21340.

UCR-34P51-37 PC$8.50/MF$2.25
California Univ., Riverside.
BEHAVIOR OF CERTAIN SYNTHETIC CHELATING AGENTS IN BIOLOGICAL AND SOIL SYSTEMS. ANNUAL PROGRESS REPORT INCLUDING A 15-YEAR SUMMARY OF REPORTS FROM THIS PROJECT.
A. Wallace. 15 May 74, 106p
Contract AT(04-3)-34

Descriptors: (*Plants, *Radionuclide kinetics), (*Americium 241, *Root absorption), (*Nutrients, Root absorption), Biological effects, Chelating agents, Diffusion, Dtpa, Radionuclide migration, Response modifying factors, Soils, Terrestrial ecosystems, Trace amounts, Tracer techniques.

For abstract, see NSA 30 08, number 21440.

UCSD-10-P-20-171 PC$28.00/MF$2.25
California Univ., La Jolla, San Diego Inst. of Marine Resources.
RESEARCH ON THE MARINE FOOD CHAIN. PROGRESS REPORT, JULY 1973–JUNE 1974.
1974, 498p
Contract AT(11-1)-GEN-10

Descriptors: (*Food chains, *Environment), Chemistry, Microorganisms, Plankton, Radioisotopes, Seas, Tracer techniques.

For abstract, see NSA 30 08, number 21341.

UR-3490-444 PC$4.00/MF$2.25
Rochester Univ., N.Y.; World Health Organization, Copenhagen (Denmark). Regional Office for Europe.
INTERNATIONAL PROGRAM FOR MICROWAVE EXPOSURE PROTECTION.
S. M. Michaelson, and M. J. Suess. 1973, 6p
CONF-740610-2

Descriptors: Biological radiation effects, Communications, Health hazards, Information, Management, Microwave radiation, Radiation protection, Safety.

For abstract, see NSA 30 08, number 23492.

UR-3490-533 PC$5.50/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
STANDARDS FOR PROTECTION OF PERSONNEL AGAINST NON-IONIZING RADIATION.
S. M. Michaelson. 1974, 49p CONF-740509-2

Descriptors: (*Personnel, *Safety), (*Ultraviolet radiation, *Safety standards), (*Lasers, Safety standards), Electromagnetic radiation, Infrared radiation, Maximum permissible exposure, Microwave radiation, Radiation protection, Radiowave radiation, Usa, Wave forms.

For abstract, see NSA 30 08, number 21361.

UR-3490-583 PC$10.75/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics.
CALCULATION OF THE RADIATION DOSE TO THE TRABECULAR SECTION OF A RAT FEMUR.
M. G. Yalcintas. 1974, 154p

Descriptors: (*Bone marrow, *Biological radiation effects), (*Iron 59, *Uptake), (*Hematopoietic system, *Radionuclide kinetics), Blood circulation, Bone tissues, Dose-response relationships, Energy levels, Femur, Irradiation, Kev range 10-100, Kev range 100-1000, Radiation doses, Rats, Response modifying factors, X radiation.

For abstract, see NSA 30 08, number 21384.

USC-113P-53 PC$4.00/MF$2.25
University of Southern California, Los Angeles.
CLINICAL APPLICATIONS OF MATHEMATICS: CHEMOTHERAPY, RADIOTHERAPY, AND PSYCHOTHERAPY. TECHNICAL REPORT NO. RB 73-19.
R. Bellman. May 73, 11p
Contract AT(04-3)-113

Descriptors: (*Medicine, *Computer calculations), (*Chemotherapy, Computer calculations), (*Radiotherapy, Computer calculations),

Behavior, Dose-response relationships, Mathematical models, Monte carlo method, Neoplasms, Patients, Radiation dose distributions.

For abstract, see NSA 30 08, number 21362.

6S. Stress Physiology

AD-785 626/3GA PC$3.25/MF$2.25
Army Research Inst of Environmental Medicine Natick Mass
ENVIRONMENT, CLOTHING AND PERSONAL EQUIPMENT, AND MILITARY OPERATIONS,
Ralph F. Goldman. 1974, 15p

Descriptors: *Army equipment, *Logistics, *Clothing, Systems analysis, Mathematical models, Environments, Body temperature, Sweat cooling, Heart, Stress(Psychology).

The paper presents a model for analysis of specific environmental medical factors contributing to mission accomplishment problems of the soldier. The model analyzes the stress imposed upon the soldier by his physical environment, clothing, equipment and mission and compares these stress demands with the physiological resources established by body size, age, and sex, and modified by fitness, relative work load and acclimatization status, and also the ability to mobilize these resources as modified by psychological factors. Finally, the model assesses the impact of any imbalance, in terms of such physiological strain responses as altered sweat production, hydration, heat production, body temperatures, heat content, and heart rate.

AD-785 648/7GA PC$3.25/MF$2.25
Army Tank-Automotive Command Warren Mich
HUMAN VIBRATION MEASURING INSTRUMENT,
Richard A. Lee, and William F. Lins. 1973, 16p

Descriptors: *Vibration, Humans, Stress(Physiology), Measurement, Tolerances(Physiology), Perception, Bioinstrumentation.

Many different investigators have attempted to quantify vibration severity by subjecting people to different vibration environments and recording their reaction. The major difficulty encountered in attempting to quantify vibration is that one is not quantifying a physical phenomenon but human reaction to an external stimulus. This reaction must take the form of a qualitative assessment or it must be relative to some other stimulus. The problems associated with both of these methods of evaluation are discussed.

AD-785 699/0GA PC$3.25/MF$2.25
Brooke Army Medical Center Fort Sam Houston Tex
Army Inst of Surgical Research
METABOLIC RATE, AMBIENT TEMPERATURE AND CATECHOLAMINES: INTERRELATIONSHIPS FOLLOWING THERMAL INJURY,
Douglas W. Wilmore, James M. Long, Robert W. Skreen, Arthur D. Mason, and Basil A. Pruitt. 26 Aug 74, 15p

Descriptors: *Catecholamines, *Burns(Injuries), *Metabolism, Stress(Physiology), Temperature, Rates, Physiological effects, Patients, Nitrogen, Body weight, Response(Biology).
Identifiers: Catabolism.

Hypermetabolism characterizes the metabolic response to thermal injury, and the magnitude of this post-traumatic physiologic alteration is closely related to the extent of injury. Negative nitrogen balance, loss of other intracellular constituents, and a rapid decrease in body weight are consequences of the increase in metabolic activity, and extensive loss of protoplasmic mass may result in severe erosion of energy and protein stores essential to optimal body function. Similarities between the thermally injured and individuals with thyrotoxicosis prompted early metabolic and endocrine studies, but the increased oxygen consumption has not been related to abnormal thyroid function. The purpose of this study was to define the relationship between surface cooling and hypermetabolism and to determine the mediator of the profound hypercatabolic response following thermal injury.

AD-785 816/0GA Reprint
School of Aerospace Medicine Brooks AFB Tex
EFFECTS OF LOWER BODY NEGATIVE PRESSURE ON PLASMA CATECHOLAMINE, PLASMA RENIN ACTIVITY AND THE VECTORCARDIOGRAM.
Final rept. Jul 72-Jan 74,
Thomas B. Graboys, Robert D. Lille, Burton J. Polansky, and Aram V. Chobanian. 1974, 9p Rept no. SAM-TR-281
Availability: Pub. in Aerospace Medicine, v45 n8 p834-839 Aug 74.

Descriptors: *Weightlessness, *Stress(Physiology), Cardiovascular system, Vectorcardiography, Blood plasma, Aerospace medicine, Exposure(Physiology), Catecholamines, Physiological effects, Orthostatism.
Identifiers: Rennin.

The effects of brief periods of exposure to lower body negative pressure (LBNP) have been studied in six normal subjects. LBNP produced significant increases in plasma catecholamines (PCA) in all subjects. The stimulation of PCA appeared to be related to the level of LBNP with greater increases noted at -50 mm Hg than at -40 mm Hg LBNP. Increases in plasma renin activity occurred consistently at -50 mm Hg LBNP but were variable at -40 mm Hg. Vectorcardiographic changes were noted during LBNP and involved primarily a shift of the QRS axis to the left and posteriorly. The findings were consistent with a rotation of the heart on its longitudinal axis and may have been secondary to the changes in intrathoracic volume induced by LBNP. (Author)

AD-785 851/7GA PC$3.75/MF$2.25
Naval Aerospace Medical Research Lab Pensacola Fla
ANNOTATED BIBLIOGRAPHY OF REPORTS: SUPPLEMENT NO. 6, 1 JUL 73-30 JUN 74,
Rita S. McAllister. 30 Jun 74, 30p
See also report dated 30 Jun 73, AD-766 458.

Descriptors: *Aviation medicine, *Aerospace medicine, *Bibliographies, Military medicine, Motion sickness, Vestibular apparatus, Barometric pressure, Altitude, Electromagnetic radiation, Adaptation(Physiology), Performance(Human), Pilots, Stress(Physiology), Aviation accidents.

Contents:
- Predicting motivational change and aeronautical adaptability among Navy and Marine Corps aviation trainees;
- Improving fleet effectiveness of Navy and Marine Corps pilots and flight officers;
- Analysis of operational functions and unique characteristics of the naval flight officer;
- Investigation of pilot background factors in naval aviation accidents;
- The effects of extremely low frequency (E.L.F.) radiation on man;
- Performance in non-human primates as influenced by low frequency electromagnetic fields;
- Anthropometric data;
- Determination of human dynamic response to impact acceleration.

AD-786 002/6GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
SOME CHARACTERISTICS OF THE ELECTRICAL ACTIVITY OF THE SKELETAL MUSCLES IN PERSONS SUFFERING FROM VIBRATION DISEASE,
E. Ts. Andreeva-Galanina, and A. F. Lebedeva. 16 Sep 74, 17p Rept no. FTD-MT-24-1026-74
Edited machine trans. from Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p27-37 1968, by Marilyn Olaechea.

Descriptors: *Vibration, *Electromyography, *Neuromuscular transmission, *Stress(Physiology), Industrial medicine, Electrophysiology, Pathology, Muscles, USSR, Translations.

The nature of changes in the electrical activity of the muscles enables one to judge the seriousness of motor disorders and the persistence of their damage. In the mechanism of motor disturbance development one should consider, in addition to the above, the pathological afferentation. An increase in the latter increases the excitability of the motor neurons. A long-term effect by an irritant results in damage of individual motor neurons. A serious pathology of the neuromuscular apparatus consequently develops, and trophic disturbances appear.

AD-786 123/0GA PC$3.75/MF$2.25
Advisory Group for Aerospace Research and Development Paris (France)
OPERATIONAL ASPECTS OF VARIATIONS IN ALERTNESS,
Bryce O. Hartman, William F. Storm, John E. Vanderveen, Ernestine Vanderveen, and Henry B. Hale. Aug 74, 42p* Rept no. AGARD-ograph-189
NATO furnished.

Descriptors: *Stress(Physiology), *Performance(Human), *Vigilance, *Operators(Personnel), Attention, Behavior, Aviation medicine, Pilots, Diet, Fatigue(Physiology), Environments, Nervous system.
Identifiers: Neurophysiology.

Variations in alertness undoubtedly affect operator performance, sometimes to a degree which significantly degrades operational effectiveness. Alertness is a biological state with behavioral, neurophysiological and biochemical elements. Related states are vigilance, attention, and arousal. This monograph summarizes the literature on these topics, as well as the influence of various environments on alertness levels, spontaneous fluctuations in alertness, and effects of such variation on operator performance. The environments under consideration include long duration flights, flights at night, monotonous tasks, solitude, mild hypoxia, and variations in thermal conditions in a flight compartment. (Author)

AD-786 261/8GA Reprint
Naval Blood Research Lab Chelsea Mass
THE RELATION BETWEEN RESPONSE TO HYPOTONIC STRESS AND THE (51)CR RECOVERY IN VIVO OF PRESERVED PLATELETS,
C. Robert Valeri, Hollace Feingold, and Leonard D. Marchionni. 5 Feb 74, 9p
Revision of report dated 8 Aug 73.
Availability: Pub. in Transfusion, v14 n4 p331-337 Jul/Aug 74.

Descriptors: *Blood platelets, *Osmotic pressure, *Stress(Physiology), Response(Biology), Humans, Low pressure, Blood preservation, Blood transfusion, Medical research.
Identifiers: Blood storage.

Platelet response to hypotonic stress can be used to estimate the 51Cr recovery in vivo of liquid- and freeze-preserved platelets. This simple in vitro test may prove helpful in determining and controlling the quality of preserved platelets. In the study, the response to hypotonic stress was not related to the 51Cr T-1/2 value of the preserved platelets, but was related to the number of irreversibly damaged platelets removed within two hours after transfusion. (Author)

AD-786 263/4GA Reprint
Naval Blood Research Lab Chelsea Mass
EFFECTS OF HYPERBARIC EXPOSURE ON HUMAN PLATELETS,
C. R. Valeri, H. Feingold, C. G. Zaroulis, R. L. Sphar, and G. M. Adams. 1974, 8p
Prepared in cooperation with Naval Submarine Medical Research Lab., Groton, Conn.
Availability: Pub. in Aerospace Medicine, v45 n6 p610-616 Jun 74.

Descriptors: *Hyperbaric conditions, *Blood platelets, *Diving, Stress(Physiology), High pressure, Blood cells, Humans, Simulation, Medical research, Decompression sickness.
Identifiers: Thrombocytopenia.

There was a 20% reduction in platelet count in six healthy male volunteers within 3 days of being subjected to a simulated dive of 30.5 meters breathing compressed air for 1 hour, and then to a maximum safety decompression schedule. During exposure to decompression, one volunteer had skin 'bends,' and three had itching. There was a significant fall in platelet count ($p<0.002$) but no decrease in 51Cr platelet survival. There were no increases in utilization of clotting factors, fibrin split products, or platelet aggregation response in vitro to ADP and epinephrine. The response of the platelets to the aggregation patterns was not consistent. The data suggest a correlation between decreased platelet count and decreased platelet production. (Modified author abstract)

N74-29447/1GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.
LIFE IN WEIGHTLESSNESS BIOLOGICAL LABORATORIES IN ORBIT.
N. Zheleznov. Jul 74, 7p NASA-TT-F-15851
Contract NASW-2485
Tran-Transl. Into English from Izv. (Ussr), 1 Mar. 1974.

Descriptors: *Biological effects, *Earth orbits, *Weightlessness, Animals, Cosmos satellites, Fungi.

For abstract, see STAR 1219

N74-29448/9GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.
THE SIGNIFICANCE OF CUMULATIVE CORIOLIS ACCELERATION FOR TESTS FOR EXPERT MEDICAL SELECTION.
I. Y. Yakovleva, V. P. Baranova, E. I. Matsnev, and A. Y. Tizul. Jul 74, 8p NASA-TT-F-15824
Contract NASW-2485
Tran-Transl. Into English from Vestn. Otorino-Laringol. (Ussr), No. 1, Jan.-Feb. 1974 p 25-28.

Descriptors: *Coriolis effect, *Human performance, Acceleration stresses (Physiology), Pathology.

For abstract, see STAR 1219

N74-30312/4GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.
THE BIOSATELLITE: RESULTS OF THE EXPERIMENT.
O. Gazenko. Jul 74, 9p NASA-TT-F-15863
Contract NASW-2485
Tran-Transl. Into English from Pravda (Ussr), No. 60 (20299), 1 Mar. 1974.

Descriptors: *Biological effects, *Exobiology, *Satellites, Aerospace medicine, Bioastronautics, Fungi, Insects, Mice, Microorganisms, Weightlessness.

For abstract, see STAR 1219

N74-30470/0GA PC$4.00/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
ON THE QUESTION OF PILOT DETERIORATION DURING LOW ALTITUDE FLIGHT.
P. Schulz. Jul 74, 20p NASA-TT-F-15799, DLR-MITT-70-12
Contract NASW-2483
Tran-Transl. Into English from the German Report Dlr-Mitt-70-12. Conf-Presented at the Meeting of the Dglr Sci. Comm. On Flight Performance and Flight Characteristics, Darmstadt, 12-13 Nov. 1970.

Descriptors: *Atmospheric turbulence, *Estimates, *Pilot performance, Aircraft design, Dynamic models, Human factors engineering, Human reactions.

For abstract, see STAR 1220

N74-30471/8GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.
PREDICTING RESISTANCE TO G-FORCES BY THE AID OF A DECOMPRESSION FUNCTIONAL TEST.
V. G. Voloshin, P. M. Suvorov, A. R. Kotovskaya, and R. A. Vartbaronov. Jul 74, 9p NASA-TT-F-15823
Contract NASW-2485
Tran-Transl. Into English from Voyenno-Med. Zh. (Ussr), No. 5, May 1974 p 56-59.

Descriptors: *Acceleration stresses (Physiology), *Gravitation, *Human tolerances, Pilots (Personnel), Pressure reduction.

For abstract, see STAR 1220

N74-30482/5GA PC$4.50/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany).
THE CATECHOLAMINE AND 17-HYDROXYCORTICOIDEXCRETION OF FIVE AQUANAUTS DURING THEIR STAY IN THE UNDERWATERLABORATORY TEKTITE 2.
H. Oser, and H. M. Wegmann. 1974, 27p DLR-FB-74-02
In German; English Summary.

Descriptors: *Catecholamine, *Diving (Underwater), *Excretion, *Hydroxycorticosteroid, Aerospace medicine, Circadian rhythms, Marine environments, Stress (Physiology), Urinalysis.

For abstract, see STAR 1220

N74-30489/0GA PC$12.25/MF$2.25
Northrop Corp., Hawthorne, Calif. Research and Technology Center.
RESEARCH ON THE PROPERTIES OF CIRCADIAN SYSTEMS AMENABLE TO STUDY IN SPACE.
Final Report.
R. G. Lindberg, and P. Hayden. Jun 74, 185p NASA-CR-137523
Contract NAS2-5037

Descriptors: *Biological effects, *Circadian rhythms, *Pocket mice, *Skylab program, *Weightlessness, Bioinstrumentation, Body temperature, Environmental control, Experimental design, Stress (Physiology), Thermoregulation.

For abstract, see STAR 1220

6T. Toxicology

AD-785 679/2GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md Biomedical Lab
NERVE AGENTS AND PESTICIDES: VALUE OF COMPUTER ANALYSIS OF ELECTROENCEPHALOGRAMS IN THE DIAGNOSIS OF EXPOSURE TO ORGANOPHOSPHATES AND CHLORINATED HYDROCARBONS,
Van M. Sim, Frank H. Duffy, James L. Burchfiel, and Maurice D. Gaon. 1971, 15p

Descriptors: *Nerve agents, *Insecticides, *Central nervous system, Exposure(Physiology), Computers, Electroencephalography, Diagnosis(Medicine), Neurology, Physiology, Dosage, Dieldrin, GB agent, Industrial medicine, Phosphorus compounds, Halogenated hydrocarbons.
Identifiers: Phosphorus organic compounds, Chlorohydrocarbons, Computer aided diagnosis.

Organophosphate (OP) and chlorinated hydrocarbon (CH) compounds, two of the major classes of insecticides, are known to have potent effects upon central nervous system (CNS) function. Commonly reported acute effects in humans include decreased attentiveness, slow motor responses, anxiety, confusion and insomnia in low doses and seizures in higher doses. The acute behavioral effects are usually accompanied by marked changes in the electroencephalogram (EEG) consisting of desynchronization, increase in beta activity, and spike wave discharges. The latter is seen only at high doses. Because of conflicting reports and lack of information on long term CNS effects, a study was designed to allow examination of the effects of insecticides upon primate brain as measured by changes in EEG activity.

AD-786 159/4GA Reprint
Armed Forces Inst of Pathology Washington D C
BLOOD AND TISSUE CONCENTRATIONS OF DRUGS ASSOCIATED WITH FATALITIES,
Nelson S. Irey. 1974, 11p
Report on Symposium on Individualization of Drug Therapy.
Availability: Pub. in Medical Clinics of North America, v58 n5 p1093-1102 Sep 74.

Descriptors: *Drugs, *Toxicology, Death, Dosage, Demography, Lethal dosage, Blood, Tissues(Biology).
Identifiers: Drug users.

The drug explosion of the past few decades has produced a large number of new drugs and chemical agents. The nonmedical use of these many substances produced not only by legitimate drug manufacturers but also by clandestine manufacture of legal drugs and the adulteration of legal and illegal drugs at street level, has complicated the investigation of drug overdose deaths. Now, more than ever, the clinician, the pathologist, and the toxicologist are called upon to interpret the significance of reported levels of drugs in body fluids and tissues. The purpose of this discussion is to present the findings in a series of 300 deaths from drug overdose: selected demographic features, toxicologic highlights, and a few cases chosen to emphasize some of the problems in analyzing and in validating the relationship between the drug and death.

UR-3055-13 PC$7.50/MF$2.25
Rochester Univ., N.Y.
EFFECT OF OUABAIN ON POTASSIUM METABOLISM AND PROLIFERATION OF MURINE LYMPHOBLASTS.
J. M. Cuff. 1974, 88p

Descriptors: (*Potassium, *Metabolism), (*Ouabain, *Biological effects), (*Cycloheximide, Biological effects), (*Actinomycin, Biological effects), Cell cultures, Cell cycle, Cell proliferation, Kinetics, Lymphocytes, Mice, Rubidium 86, Tracer techniques.

For abstract, see NSA 30 08, number 23390.

7. CHEMISTRY

7A. Chemical Engineering

AD-785 997/8GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio

FORECASTING PROBLEMS IN THE CHEMICAL INDUSTRY,
Ya. Balashsha, K. Bitai, and F. Chagol. 27 Aug 74, 14p Rept no. FTD-HC-23-2363-74
Edited trans. of mono. from Sovet Ekonomicheskoi Vzaimopomoshchi. Psotoyannaya Komissiya po Koordinatsii Nauchnykh i Tekhnicheskikh Issledovanii. Teoriya i Praktika Progozirovaniya Razvitiya Nauki i Tekhniki v Stranakh-Chlenakh Sev, n.p., 1971 p275-281.

Descriptors: *Chemical industry, Economics, Consumption, Production, Forecasting, Translations, USSR.

AD-786 233/7GA PC$3.75/MF$2.25
Sage Action Inc Ithaca N Y
DEVELOPMENT AND TEST OF A TECHNIQUE TO CREATE LIQUID SUSPENSIONS OF SUBMICRON METALLIC PARTICLES.
Technical rept. no. 3, 1 Apr 71-31 Mar 73,
R. W. Hale, D. E. Ordway, and P. Tan. Dec 73, 33p Rept no. SAI-RR-7301
Contract N00014-69-C-0170

Descriptors: *Dispersions, *Powder metals, Performance(Engineering), Liquids, Particles, Aerosol generators, Dispersing, Particle size, Bubbles.

An investigation has been carried out to find a practical way to create liquid suspensions of submicron metallic particles. Particles of suitable size and purity were produced by a technique developed at Oak Ridge National Laboratory using the Exploding Wire Aerosol Generator (EWAG). To introduce the particles from the resulting aerosol into a liquid, a prototype Particle Transfer Device (PTD) was devised and constructed. This device uses a unique Collimated Hole Structure (CHS) to form large quantities of tiny bubbles within the liquid. Capture of the particles within these bubbles is by diffusion to the bubble walls. Initial qualification tests substantiated the concept, but the efficiency was quite low because of unanticipated electrical effects. Corrective actions are suggested which may enable the full potential of the concept to be realized. (Author)

AEC-tr-7556 PC$4.00/MF$2.25
ACTIVATED CHARCOAL FOR PURIFYING TOXIC ATMOSPHERES AND PROCESSES FOR PREPARATION THEREOF.
16 Jun 69, 8p
Translation of French Patent 1,575,501.

Descriptors: (*Activated carbon, *Sorptive properties), (*Charcoal, Sorptive properties), (*Atmospheres, *Purification), Chemical preparation, Toxicity.

For abstract, see NSA 30 08, number 23345.

CONF-740614-4 PC$4.00/MF$2.25
Allied Chemical Corp., Idaho Falls, Idaho.
REDUCTION OF NO/SUB X/ WITH AMMONIA OVER ZEOLITE CATALYSTS.
T. R. Thomas, and D. T. Pence. 1974, 12p
Contract AT(10-1)-1375

Descriptors: (*Nitrogen oxides, *Reduction), Air pollution, Ammonia, Catalysts, Coal, Cost benefit analysis, Efficiency, Environment, Flue gas, Fossil-fuel power plants, Laboratory-scale experiments, Removal, Sulfur dioxide, Zeolites.

For abstract, see NSA 30 08, number 23350.

PAT-APPL-459 737 PC$3.25/MF$2.25
Atomic Energy Commission, Washington, D.C.
ELECTROLYTIC DISSOLVER.
Patent Application,
Earl J. Wheelwright, and Richard D. Fox. Filed 10 Apr 74, 17p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Dissolvers, *Electrolytic cells, *Patent applications, Plutonium, Nitric acid.
Identifiers: PAT-CL-204-272.

The patent application concerns an electrolytic dissolver. Dissolution occurs by solution contact including a vessel of electrically insulative material, a fixed first electrode, a movable second electrode, means for insulating the electrodes from the material to be dissolved while permitting a free flow of electrolyte therebetween, means for passing a direct current between the electrodes and means for circulating electrolyte through the dissolver. The invention can be used for dissolving plutonium metal in HNO3.

PATENT-3 785 120 Not available NTIS
Atomic Energy Commission, Washington, D.C.
RECOVERY OF PURIFIED HELIUM OR HYDROGEN FROM GAS MIXTURES.
Patent,
James R. Merrimam, John H. Pashley, Michael J. Stephenson, and David I. Dunthorn. Filed 15 Oct 71, patented 15 Jan 74, 8p PAT-APPL-189 546
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Gas purification, *Hydrogen, *Helium, *Fluorohydrocarbons, Materials recovery, Liquids, Contaminants, Absorbents, Hydrocarbons.
Identifiers: PAT-CL-55-44.

The patent describes a process for the removal of helium and hydrogen from gaseous mixtures also containing contaminants. The gaseous mixture is contacted with a liquid fluorocarbon in an absorption zone maintained at superatmospheric pressure to preferentially absorb the contaminants in the fluorocarbon. Unabsorbed gas enriched in hydrogen or helium is withdrawn from the absorption zone as product. Liquid flurocarbon enriched in contaminants is withdrawn separately from the absorption zone.

PATENT-3 792 154 Not available NTIS
Atomic Energy Commission, Washington, D.C.
REMOVAL OF IODINE FROM NITRIC ACID SOLUTIONS.
Patent,
George I. Cathers, and Calvin J. Shipman. Filed 6 Mar 72, patented 12 Feb 74, 3p PAT-APPL-231 820
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Nitric acid, *Autoclaving, *Iodine 131, *Decontamination, Radioactive isotopes, Dilution, Solutions, Distillation, Nuclear fuel reprocessing, Complex compounds.
Identifiers: PAT-CL-423-390.

The patent describes a method for removing radioactive iodine from nitric acid solution by isotopically diluting the iodine and autoclaving the solution prior to separation. Autoclaving increases the efficiency of the subsequent distillation separation.

PATENT-3 792 155 Not available NTIS
Atomic Energy Commission, Washington, D.C.
METHOD FOR INCREASING THE CARBON YIELD OF INDENE-DERIVED CARBON PRECURSORS.
Patent,
Wesley E. Smith, and Ottis J. Horne, Jr. Filed 27 Apr 72, patented 12 Feb 74, 4p PAT-APPL-248 324
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Graphite, *Carbonization, *Additives, Microstructure, Anhydrides, Thermoplastic resins, Yield.
Identifiers: PAT-CL-423-448, Benzene tetracarboxylic dianhydride/1-2-4-5, *Indenes.

The invention relates to the preparation of carbon and graphite from carbon precursors of indene derivatives such as truxene, isotruxene, and cinnamylideneindene. The carbon yield of carbon precursors is substantially increased and the microstructure of graphite prepared from this carbon is reproducibly controlled by the addition of selected quantities of pyromellitic dianhydride to the carbon precursors.

PATENT-3 793 435 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SEPARATION OF HYDROGEN FROM OTHER GASES.
Patent,
James J. Reilly, and Richard H. Wiswall, Jr. Filed 10 May 72, patented 19 Feb 74, 2p PAT-APPL-251 874
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Chemisorption, *Hydrogen, *Lanthanum containing alloys, *Absorbers(Materials), Carbon dioxide, Separation, Carbon monoxide, Nickel alloys, Copper alloys, Hydrides.
Identifiers: PAT-CL-423-248.

The patent describes a method for selectively absorbing hydrogen from a gaseous mixture containing at least one other gas. In the presence of CO2, an alloy of the approximate composition LaNi5 is employed; and, in the presence of CO, copper replaces some of the nickel in such an alloy. A metal hydride is formed in which the rare earth-nickel alloy is hydrided.

PATENT-3 794 116 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SITU COAL BED GASIFICATION.
Patent,
Gary H. Higgins. Filed 30 May 72, patented 26 Feb 74, 9p PAT-APPL-257 965
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Coal gasification, *Patents, *In situ combustion, *Manufactured gas, Steam, Oxygen, Methane, Carbon dioxode, Pressure.
Identifiers: PAT-CL-166-259.

The invention describes an improved process for use in the in-situ gasification of deeply buried thick coal beds to provide high quality synthetic fuel gas. The formation is fractured explosively. The uppermost layer of the fragmented zone is ignited as by injection of oxygen and fuel gas from a surface plant through reactant input conduits while the product conduits are closed off to raise the operating pressure, so that the fragmented zone comprises effectively a pressurized reaction vessel. Water or steam together with regulated amounts of oxygen are then introduced while reaction products are withdrawn at a rate at which operating pressure is maintained so that a relatively higher temperature reaction zone layer is reacted in the upper layer to travel progressively downward. The net overall products are methane and CO2.

PATENT-3 796 545 Not available NTIS
Atomic Energy Commission, Washington, D.C.
DEVICE FOR PREPARING ELEMENTAL CARBON ENRICHED IN CARBON-13.
Patent,
Jerome C. Liner. Filed 23 Feb 72, patented 12 Mar 74, 4p PAT-APPL-228 615
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Carbon dioxide, *Chemical reactors, Diffusion, Reduction(Chemistry), Tubes, Fluid flow, Iron.
Identifiers: PAT-CL-23-259-5, *Carbon 13.

The patent concerns an apparatus which efficiently converts carbon-13 enriched CO2 into high purity elemental carbon-13 by reduction by iron particles. The invention comprises an enclosure separated by an apertured wall portion into two chambers, and means to facilitate passage of a reaction product in one direction but to prevent its passage in the opposite direction. Ferrous chloride produced in the reaction is thereby prevented from diffusing back into the reaction chamber.

PATENT-3 800 023 Not available NTIS
Atomic Energy Commission, Washington, D.C.
LOADING A CATION EXCHANGE RESIN WITH URANYL IONS.
Patent,
Paul A. Haas. Filed 16 May 72, patented 26 Mar 74, 5p PAT-APPL-253 731
Government-owned invention available for licensing. Copy of patents available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Ion exchange resins, *Uranyl compounds, *Cation exchanging, Solutions, Loading, Nuclear fuel particles.
Identifiers: Uronyl nitrates, PAT-CL-423-7.

The patent describes a method for loading cation exchange resins with uranyl ions from an acid deficient solution of uranyl nitrate. Heat treatment of the resin produces a microsphere of either the carbide or oxide of the loaded cation. Such microspheres are useful as nuclear fuels.

PB-234 488/5GA PC$3.25/MF$2.25
University of Southern California, Los Angeles. Dept. of Electrical Engineering.
INVARIANT IMBEDDING, ITERATIVE LINEARIZATION AND MULTISTAGE COUNTER CURRENT PROCESSES. VIII. ESTIMATION OF MINIMUM REFLUX AND MULTIPOINT BOUNDARY VALUE PROBLEM.
Technical rept.,
E. Stanley Lee. May 73, 17p USC-113P-55, RB73-21
Contract AT(04-3)-113, Grant NSF-GK-26212

Descriptors: *Refluxing, Columns(Process engineering), Distillation, Differential equations.
Identifiers: Multipoint boundary value problems, Invariant imbedding, Quasilinearization.

The problem of estimating the minimum reflux ratio is treated as a nonlinear multipoint boundary value problem in difference equations. If the problem has a solution, the minimum reflux ratio and the compositions in the column are obtained simultaneously by quasilinearization iteration. With very rough initial approximations or starting values, only nine iterations are needed to obtain a four digit accuracy in concentration. A three digit accuracy in distillate rate is obtained in seven iterations.

PB-235 840/6GA PC$7.50/MF$2.25
Argonne National Lab., Ill.
REDUCTION OF ATMOSPHERIC POLLUTION BY THE APPLICATION OF FLUIDIZED-BED COMBUSTION.
Monthly progress rept. no. 62, Dec 73-Jun 74,
A. A. Jonke. Oct 74, 245p ANL/ES-CEN-F062
Contract DI-14-32-0001-1543

Descriptors: *Air pollution control, *Fluidized bed processing, *Coal, *Combustion, Combustion efficiency, Nitrogen oxides, Sulfur dioxide, Regeneration(Engineering), Limestone, Dolomite(Rock), Process variables.
Identifiers: *Limestone injection.

An experimental program is being carried out at Argonne National Laboratory (ANL) to develop advanced technology in pressurized, fluidized-bed combustion of coal and to investigate the effects of operating variables on combustion efficiency, sulfur retention efficiency, and NOx and trace-element levels in the flue gas. Methods for the regeneration of the sulfated additive are being studied so that the additive can be reused in the combustor. Most of the recent experimental work has been devoted to studying various aspects of the different regeneration schemes. However, concurrently with the regeneration studies, the testing and operation of the combustor have continued.

PB-235 898/4GA PC$7.25/MF$2.25
Pope, Evans and Robbins, Inc., Alexandria, Va.
DEVELOPMENT OF COAL FIRED FLUIDIZED-BED BOILERS. MONTHLY PROGRESS REPORTS NOS. 32 (OCTOBER 1967) THROUGH 44 (OCTOBER 1968).
Oct 74, 221p
Contract DI-14-01-0001-478
See also PB-235 899.

Descriptors: *Fluidized bed processing, *Combustion, *Boilers, *Coal, Dolomite(Rock), Gas analysis, Fluidized bed processors, Performance evaluation, Fly ash, Air pollution, Tests, Columns(Process engineering), Sulfur dioxide, Exhaust gases, Nitrogen oxides, Hydrocarbons, Superheaters, Heat transfer, Design, Size separation.
Identifiers: *Air pollution control.

The progress reports describe research on a coal-burning fluidized bed boiler. Aspects including air pollution control and exhaust emissions, fly ash combustion and carbon loss, coal feeding and classification, and efficiency and design are discussed.

PB-235 899/2GA PC$7.50/MF$2.25
Pope, Evans and Robbins, Inc., Alexandria, Va.
DEVELOPMENT OF COAL FIRED FLUIDIZED-BED BOILERS. MONTHLY PROGRESS REPORTS NOS. 45 (NOVEMBER 1968) THROUGH 54 (AUGUST 1969).
Oct 74, 234p
Contract DI-14-01-0001-478
See also PB-235 898.

Descriptors: *Fluidized bed processing, *Coal, *Combustion, *Boilers, Exhaust gases, Size separation, Feeding(Supplying), Dalomite(Rock), Sulfur dioxide, Nitrogen oxides, Hydrocarbons, Limestone, Design, Pilot plants, Heat transfer, Particle size, Performance evaluation, Fluidized bed processors.
Identifiers: *Air pollution control, Limestone injection.

The report is the second set of a series of progress reports on research concerning coal-fired fluidized bed combustion for steam generation. Air pollutuon aspects are discussed including limestone injection control efforts and exhaust emissions. Also coal feeding and classification are discussed as well as general performance and design.

PB-235 908/1GA PC$3.25/MF$2.25
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
THE ELECTRICAL PROCESS IN THE BREAKING OF DILUTE OIL-IN-WATER EMULSIONS.
Completion rept., 1 Jul 73-30 Jun 74,
Clyde Orr, Jr., and Edward Y. H. Keng. Jun 74, 25p ERC-0674 W74-12343, OWRR-A-049-GA(1)
Contract DI-14-31-0001-4010

Descriptors: *Industrial waste treatment, *Oils, *Emulsions, Zeta potential, Greases, Waxes, Detergents, Water pollution, Dispersing.
Identifiers: Oil wastes, Water pollution control, Oil pollution.

Oils, greases, and waxes frequently occur in industrial waste waters. Simultaneously, soaps and detergents enter most waste waters from domestic and other sources. When the mixtures of waste particles in water, known as emulsions, come in contact with the soaps and detergents, they generally become quite stable. One way to break such emulsions and thereby separate out the wastes is to add chemicals that will cause the oil droplets to agglomerate into larger drops. This study sought to assess the usefulness of electrical measurements, particularly the so-called zeta potential, in guiding the treatment process to chemicals and application rates that can break measured emulsions. When the zeta potential, which for a highly stable emulsion may be as negative as -0.090 volt, is made to approach -0.015 volt, the stability of the emulsion deteriorates rapidly. Past this point, oil-in-water emulsions often break spontaneously. The larger drops will then rise to the water surface and form a distinct oil layer that can be easily removed. Laboratory applications of various chemicals to emulsion samples and subsequent zeta potential measurement should thus provide a ready guide to those trying to remove oily waste water discharge. (Modified author abstract)

7B. Inorganic Chemistry

AD-785 884/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
DETERMINATION OF CU(+2) AND AG(+) CONTENT IN SOLID SOLUTIONS BASED ON LEAD AZIDE BY STRIPPING ANALYSIS,
V. P. Pichugina, and S. M. Ryabykh. 19 Nov 73, 4p Rept no. FSTC-HT-23-915-73
Trans. of Politekhnicheskii Institut, Tomsk. Izvestiya (USSR) v199 p66-67 1969.

Descriptors: *Lead azides, *Copper, *Silver, *Chemical analysis, Chemical precipitation, Impurities, Cations, Solid solutions, USSR, Translations, Electrolysis.

A precise, simple and sensitive method of determination of Ag(+) and Cu(+2) concentrations in PbN6, by stripping analysis, is discussed. A considerable discrepancy was revealed, in the data presented, between amounts of additives in the initial nitrate solutions and amounts precipitated.

IFTJ-50/PS PC$4.00/MF$2.25
Institute of Nuclear Physics and Techniques, Krakow (Poland).
TWO-PHONON ANALYSIS FOR THE CHAIN MODEL OF LEPIDOCROCITE (GAMMA -- FEOOH).
K. Sokalski, and A. Mazurkiewicz. Dec 73, 13p
U.S. Sales Only.

Descriptors: (*Iron hydroxides, *Emission spectra), (*Iron oxides, Emission spectra), Phonons, Raman effect, Spectra, Symmetry.

For abstract, see NSA 30 08, number 23357.

LBL-2580 PC$4.25/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
KINETICS OF DECOMPOSITION OF BARIUM CARBONATE.
T. K. Basu. Apr 74, 23p
Contract W-7405-eng-48

Descriptors: (*Barium carbonates, *Decomposition), Chemical analysis, Chemical reaction kinetics, Enthalpy, Langmuir probe, Monocrystals, Thermodynamics.

For abstract, see NSA 30 08, number 23367.

PB-235 406/6GA PC$5.75/MF$2.25
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
THE TRACE ANALYSIS OF WATER FOR SELECTED METALLIC ELEMENTS EMPLOYING SQUARE-WAVE POLAROGRAPHY.
Completion rept., 1 Jul 71-31 Jul 74,
Peter E. Sturrock, and Richard J. Carter. Jul 74, 141p ERC-0874 W74-11679, OWRR-B-063-GA(1)
Contract DI-14-31-0001-3571

Descriptors: *Polarographic analysis, *Water analysis, *Trace elements, Nickel, Tin, Iron, Tellurium, Cobalt, Bismuth, Manganese, Arsenic, Antimony, Lead(Metal), Zinc, Cadmium, Copper, Metals, Square waves, Electrolytes, Electrodes, Performance evaluation, Cost estimates, Sensitivity, pH.
Identifiers: Dropping mercury electrode, *Water pollution detection.

A highly sensitive technique was developed to detect heavy metal pollutants at a cost comparable to that of atomic absorption spectroscopy. The instrument is based on the technique of square-wave polarography and uses a dropping mercury electrode (DME). The limits of detection (as parts per billion) for thirteen elements are: Cu(II), 0.6; Cd(II), 0.6; Zn(II), 0.6; Pb(II), 0.8; Sb(III), 3.7; As(III), 3.7; Mn(II), 4.4; Ni(II), 4.7; Sn(IV), 4.8; Fe(III), 5.6; Tl (I), 6.1; Co(II), 19; Bi(III), 21. In all cases, peak height was a linear function of concentration. The use of the hanging mercury drop and the thin mercury film disk electrodes for the analysis of very low concentrations of metals was also investigated. In less than 15 minutes analysis time, concentrations below 10 to the minus 9th power could be determined for metals amenable to stripping analysis. Results are reported for the analysis of EPA water reference standards employing the rotating disk and dropping mercury electrodes.

7C. Organic Chemistry

AD-785 624/8GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J
TNT BY-PRODUCT ISOMER RECOVERY FOR CREDIT,
Everett E. Gilbert. 1973, 11p

Descriptors: *TNT, *Sulfonates, *DNT, Wastes(Industrial), Hydrolysis, Amines, Toluidines.
Identifiers: Water pollution control, Nitro compounds.

The report discusses on a preliminary basis the chemical feasibility of reduction-hydrolysis concept for recovery of TNT and DNT sulfonated by-product meta isomers as the corresponding amines. Further study aimed toward ultimate large-scale production appears warranted.

AD-785 822/8GA Reprint
Boston Univ Mass Dept of Chemistry
RADICALS AND SCAVENGERS. III. THE CAGE EFFECT IN THE DECOMPOSITION OF 'TERT'-BUTYL DIPHENYLPERACETATE,
John P. Lorand, and Robert W. Wallace. 21 Jun 73, 7p AROD-7567.5-C
Grant DA-ARO(D)-31-124-G1017
See also report dated 6 Nov 72, AD-765 085.
Availability: Pub. in Jnl. of the American Chemical Society, v96 n5 p1398-1402 1974.

Descriptors: *Pyrolysis, *Peroxides, Acetates, Free radicals.
Identifiers: Peroxyacetic acid/(butyl-ester)-diphenyl, *Cage effect(Chemistry).

The title perester, I, on thermal decomposition in cumene at 60C, affords CO2 quantitatively when allowance is made for the presence of the impurities benzophenone and tert-butyl benzhydryl ether (II). The cage effect resulting in the formation of II is found by both scavenger and product isolation methods. Decomposition of I in 88% mineral oil-12% chlorobenzene gives a much reduced yield of tert-butyl alcohol and an increase in the yield of II, further supporting the postulated cage effect. In addition, a phantom' ca. 10% cage effect, probably involving p coupling of tert-butoxy and benzhydryl radicals, is postulated to explain the deficient material balance. (Modified author abstract)

AD-786 035/6GA PC$3.75/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THERMAL STABILITY OF POLYHETEROARYLENES,
E. M. Bondarenko, V. V. Rode, and V. V. Korshak. 18 Feb 74, 46p Rept no. FSTC-HT-23-1871-73
Trans. of mono. Uspekhi Khimii i Fiziki Polimerov, Moscow, 1970 p206-231

Descriptors: *Nitrogen heterocyclic compounds, *Polymers, *Heat resistant plastics, Molecular structure, Thermal stability, Polyimide resins, Reviews, Translations, USSR.
Identifiers: Polybenzimidazoles, Polybenzoxazoles, Polybenzothiazoles.

Fully aromatic high-molecular compounds exhibit high thermal stability and a prominent class of these compounds is the polyheteroarylenes – aromatic systems consisting of aromatic rings and various heterocycles. This review summarizes literature reports through 1969 on polyheteroarylenes containing five-membered heterocycles (polyimides, polybenzazoles, and polyazoles), polyheteroarylenes containing six-membered heterocycles (polynaphthyridines and polyazines), and mixed polyheteroarylenes.

AD-786 095/0GA Reprint
Boston Univ Mass Dept of Chemistry
RADICALS AND SCAVENGERS. VI. THE ABSOLUTE RATE CONSTANT FOR REACTION OF 'TERT'-BUTOXY RADICAL WITH TOLUENE BY A COMPETITION TECHNIQUE,
John P. Lorand, and Robert W. Wallace. 28 Jul 73, 8p AROD-7567.8-C
Grant DA-ARO(D)-31-124-G1017
See also report dated 21 Jun 73, AD-785 822.
Availability: Pub. in Jnl. of the American Chemical Society, v96 n9 p2874-2879, 1 May 74.

Descriptors: *Free radicals, *Exchange reactions, *Toluenes, Reaction kinetics, Rates.
Identifiers: Alkoxy compounds.

The absolute rate constant, for the reaction of tert-butoxy radicals with toluene, t-BuO + PhCH3 to t-BuOH + PhCH2, at 25C in toluene, is found by applying a competition technique to the decompositions of tert-butyl triphenylperacetate and tert-butyl 2,2-diphenyl-3,3-dimethylperbutanoate. The stable radicals triphenylmethyl and 1,1-diphenylneopentyl are observed and evidently compete with toluene for tert-butoxy radicals. The rate constants for the latter reactions are evaluated theoretically and corrected with the aid of cage effects, under the critical assumption that geminate and and bulk radicals have the same reactivity in coupling reactions. (Modified author abstract)

AD-786 099/2GA Reprint
Texas Univ Austin Dept of Chemistry
ELECTROGENERATED CHEMILUMINESCENCE. XIV. EFFECT OF SUPPORTING ELECTROLYTE CONCENTRATION AND MAGNETIC FIELD EFFECTS IN THE 9,10-DIMETHYLANTHRACENE-TRI-P-TOLYLAMINE SYSTEM IN TETRAHYDROFURAN,
Csaba P. Keszthelyi, Nurhan E. Tokel-Takvoryan, Hiroyasu Tachikawa, and Allen J. Bard. 10 Sep 73, 6p AROD-8352.18-C
Grant DA-ARO-D-31-124-73-G34
Revision of report dated 13 Aug 73. See also Part 12, AD-765 111.
Availability: Pub. in Chemical Physics Letters, v23 n2 p219-222, 15 Nov 73.

Descriptors: *Chemiluminescence, Anthracenes, Amines, Electrolytes, Magnetic fields, Charge transfer, Anions, Cations, Free radicals.
Identifiers: *Tritolyamine, *Anthracene/dimethyl.

A comparison of the efficiency of photon production in the chemiluminescence studies of Weller and Zachariasse and in ECL for the system involving reaction of 9,10-dimethylanthracene (DMA) radical anion and tri-p-tolylamine (TPTA) radical cation in tetrahydrofuran (THF) solutions was undertaken. The luminescence intensity increased and the magnitude of the magnetic field effect decreased when the supporting electrolyte (TBAP) concentration was decreased from 0.2M to 10 mM. The ECL efficiency, extrapolated to low TBAP concentrations, was in good agreement with that of the chemiluminescence studies. (Author)

AD-786 114/9GA Reprint
Vermont Univ Burlington Dept of Chemistry
CARBANION ADDITIONS AND CYCLIZATIONS INVOLVING ANIONIC SIGMA COMPLEXES. META BRIDGING REACTIONS OF AROMATICS,
Michael J. Strauss. 21 Jan 74, 10p AROD-8380.22-C
Contract DAHC04-69-C-0064
Availability: Pub. in Accounts of Chemical Research, v7 p181-188 1974.

Descriptors: *Polycyclic compounds, Stereochemistry, Chemical structure, Molecular structure, Chemical reactions, Aromatic compounds.
Identifiers: *Cyclization, *Rearrangement reactions.

Mechanisms by which certain bicyclic structures form, including the directive effects of aromatic substituents and the effects of side-chain structure on the ease of intramolecular cyclization, are discussed. (Modified author abstract)

AD-786 200/6GA Reprint
Boston Univ Mass Dept of Chemistry
RADICALS AND SCAVENGERS. V. STERIC HINDRANCE AND CAGE EFFECTS IN THE DECOMPOSITIONS OF SEVERAL TERT-BUTYL PERESTERS,
John P. Lorand. 28 Jul 73, 10p AROD-7567.7-C
Grant DA-ARO-D-31-124-G1017
See also AD-785 822.
Availability: Pub. in Jnl. of American Chemical Society, v96 n9 p2867-2874, 1 May 74.

Descriptors: *Decomposition, Chemical structure, Stereochemistry, Peroxides, Esters.
Identifiers: *Cage effect, *Peroxy esters.

Product isolation and scavenger methods have been used to study the cage effects in decompositions in cumene and chlorobenzene of several tert-butyl peresters, RCO3-t-Bu, including the peracetate (R = CH3), perpivalate (R = (CH3)3C),p-nitro-and p-methoxyphenylperacetates (R = p-O2NC6H4CH2 and p-H3COC6H4CH2, respectively), phenylperisobutyrate (R = C6H5C(CH2)3), diphenylperpropionate (R = (C6H5)2C(CH3)), and diphenylpermalonate (C6H5)2C(CO3-t-Bu)2). As previously reported for the diphenylperacetate (R = (C6H5)2CH), reaction of tert-butoxy radicals with R in bulk solution does not occur. For tertiary R, cage effects involving coupling are small, ca.0-12%, but for primary R, ca. 30% or more. Disproportionation is ca. 5-10% per beta-hydrogen atom of R. Steric repulsion is proposed as explanation for small or nil amounts of cage coupling. (Modified author abstract)

AD-786 236/0GA PC$3.75/MF$2.25
California Univ Los Angeles Dept of Chemistry
METALLOCARBORANES: PAST, PRESENT, AND FUTURE.
Technical rept.,
Timm E. Paxson, Kenneth P. Callahan, Elvin L. Hoel, and M. Frederick Hawthorne. 18 Sep 74, 39p* Rept no. TR-76
Contract N00014-69-A-0200-4019

Descriptors: *Carboranes, Metal complexes, Metalorganic compounds, Reviews, Molecular structure, Chemical reactions, Catalysts, Substitution reactions, Synthesis(Chemistry).
Identifiers: *Metallocarboranes, Rearrangement reactions.

The report reviews the development of metallocarborane chemistry. Synthesis and reactions are described including polyhedral expansion, contraction, and subrogation, as well as rearrangement and substitution. Homogeneous catalysis by metallocarboranes is also discussed.

AD-786 259/2GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
DECOMPOSITION OF PROPANE BEHIND REFLECTED SHOCKS IN A SINGLE PULSE SHOCK TUBE,
Karl Scheller, Assa Lifshitz, and Alexander Burcat. 1973, 12p Rept no. ARL-74-0042
Availability: Pub. in Recent Developments in Shock Tube Research, 1973 p690-699.

Descriptors: *Propane, *Decomposition, *Shock waves, Temperature, Reaction kinetics, Activation energy, Rates.
Identifiers: Chemical reaction mechanisms.

The decomposition of propane was studied behind reflected shocks in a single pulse shock tube. The temperature range covered was 1050-1650K, at pressures varying from 50 to 200 torr. Shocked samples were taken from the end plate of the driven section and analyzed by gas chromatography for CH4, C2H4, C2H6, C3H6 and H2 as primary products and for C2H2, CH3-CCH and CH2=C=CH2 as secondary products. Three groups of experiments run at a varying pressure and composition enabled the evaluation of the reaction orders and activation energies for each one of the reaction products observed. (Modified author abstract)

AD-786 264/2GA Reprint
Case Western Reserve Univ Cleveland Ohio Dept of Chemistry
SYNTHETIC METHODS AND REACTIONS. VIII. NITROFLUORINATION OF ALKENES,
George A. Olah, and Masatomo Nojima. 27 Aug 73, 5p AROD-10368.5-C
Grant DA-ARO-D-31-124-72-G157
See also report dated 3 May 73, AD-771 938.
Availability: Pub. in Synthesis, n12 p785-786 Dec 73.

Descriptors: *Alkenes, *Nitration, *Fluorination.

A convenient general method of nitrofluorination of alkenes is reported. (Author)

AD-786 268/3GA Reprint
Case Western Reserve Univ Cleveland Ohio Dept of Chemistry
AROMATIC SUBSTITUTION. XXXIV. THE DIFFERING NATURE AND SELECTIVITY OF THE NITRATION OF NITRO(DINITRO)BENZENE AND -TOLUENES FROM THAT OF BENZENE AND TOLUENE,
George A. Olah, and Henry C. Lin. 12 Apr 73, 7p AROD-10368.3-C
Grant DA-ARO-D-31-124-72-G157
See also AD-771 938.
Availability: Pub. in Jnl. of the American Chemical Society, v96 n2 p549-553, 23 Jan 74.

Descriptors: *Nitrobenzenes, *Toluenes, *Nitration, Benzene, Substitution reactions, Molecular isomerism, Stereochemistry, Rates, Reaction kinetics.

The competitive and noncompetitive rates and isomer distributions of nitration of nitro(dinitro)benzene and -toluenes with nitronium salts in nitromethane and sulfuric acid solutions were determined. The reactions show high substrate selectivity indicating 'late,' i.e., arenium ion like nature of the transition states of highest energy. This is also reflected in the increased para substitutions (related to the methyl group) in nitration of nitrotoluenes. The significant differences in the nature and selectivity of the nitronium salt nitration of benzene and toluene from those of nitro(dinitro)benzene and -toluenes are discussed in terms of the differing nature of the involved transition states. (Author)

CNAEM-R-120 PC$4.50/MF$2.25
Cekmece Nuclear Research Center, Istanbul (Turkey).
EFFECT OF SUBSTITUENTS ON THE RATE OF PROTODETRITIATION OF (4- EXP 3 H) PHENANTHRENE.
S. Korkut. 1973, 29p
U.S. Sales Only.

Descriptors: (*Dehydrogenation, *Chemical reaction kinetics), Aromatics, Hydrogenation, Isomers, Phenanthrene, Sample preparation.

For abstract, see NSA 30 08, number 23348.

COM-74-50881/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
A NOVEL ION-MOLECULE REACTION INVOLVING CLEAVAGE OF THE CARBONYL BOND IN KETONES AND ALDEHYDES.
Final rept.,
J. R. Eyler, P. Ausloos, and S. G. Lias. 29 May 74, 3p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in Jnl. of the American Chemical Society, v96 n11 p3673-3675, 29 May 74.

Descriptors: *Exchange reactions, *Aldehydes, *Ketones, *Fluorohydrocarbons, *Chlorohydrocarbons, Dissociation, Ions, Reaction kinetics.
Identifiers: Ion molecule interactions.

The reactions of CF3(+), CCl3(+), and C2F5(+) with aldehydes and ketones have been investigated. Ninety-five percent or more of the reactive encounters between CF3(+) or CCl3(+) and CH3COCH3, CH3CHO, C2H5COCH3, C2H5COC2H5, and n-C4H9COCH3 result in a reaction in which an O atom and F(+) or Cl(+) are exchanged, in what is apparently a concerted mechanism. The product R'CXR(+) ions have a tendency to dissociate by losing HX; the stability of the R'CXR(+) ions vis-a-vis this dissociation is very sensitive to the exothermicity of the CX3(+)-R'COR reaction, showing a greater tendency to dissociate for larger R'COR reactant molecules. Further, the rate constants of the reactions of CCl3(+) are slower by 1-2 orders of magnitude than the rates of the corresponding reactions of CF3(+).

COM-74-50891/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CHEMICAL IONIZATION MASS SPECTRA. XXI. REACTIONS IN T-C5H11CL, T-C5H11BR, T-C5H11OH, AND T-C5H11SH.
Final rept.,
S. G. Lias, A. Viscomi, and F. H. Field. 1974, 6p
Pub. in Jnl. of the American Chemical Society, v96 n2 p359-364, 23 Jan 74.

Descriptors: *Butanes, *Gas ionization, Displacement reactions, Elimination reactions, Pressure, Temperature, Concentration(Composition), Chemical bonds, Dissociation, Mass spectra.
Identifiers: Proton transfer.

Mixtures of isobutane with small amounts (0.01-1%) of added t-C5H11Cl, t-C5H11Br, t-C5H11OH, and t-C5H11SH have been studied in a high pressure mass spectrometer as a function of total pressure, temperature, and concentration of additive. The major reaction observed with each of the four molecules is the formation of a condensation ion which dissociates rapidly to give (C9H19(+) + HX) or (C5H11(+) + C4H9X) where X is Cl, Br, OH, or SH. The direct bond cleavage to form C5H11(+) is favored under all conditions, but the formation of C9H19(+) becomes more important as the pressure is raised or the temperature is lowered, indicating that it originates from a less highly excited precursor ion. Results suggest that when proton transfer competes with the displacement reaction, the two reactions proceed through the same intermediate ion, a C5H11XC4H9(+) species in which 'internal' proton transfer has occurred.

CONF-740314-3 PC$4.00/MF$2.25
Allied Chemical Corp., Idaho Falls, Idaho.
DETERMINATION OF ORGANIC CARBON IN WATER WITH A SILVER-CATALYZED PEROXYDISULFATE WET CHEMICAL OXIDATION METHOD.
J. M. Baldwin, and R. E. McAtee. 1974, 19p

Descriptors: (*Carbon, *Chemical analysis), (*Water, Chemical analysis), Carbon, Catalysts, Efficiency, Liquids, Oxidation, Silver.

For abstract, see NSA 30 08, number 23349.

COO-2026-12 PC$4.25/MF$2.25
Minnesota Univ., Minneapolis Dept. of Chemical Engineering and Materials Science.
TUBULAR REACTOR STUDY OF THE KINETICS OF HYDROXYL RADICAL-OLEFIN REACTIONS.
A. Patrana V., and R. W. Jr. Carr. 1973, 22p

Descriptors: (*Hydroxyl radicals, *Chemical reactions), (*Ethylene, Chemical reactions), (*Propylene, Chemical reactions), (*Butenes, Chemical reactions), Alkenes, Decay, Hydrogen, Kinetics, Low pressure, Medium temperature, Reactors.

For abstract, see NSA 30 08, number 23351.

COO-3435-16 PC$10.50/MF$2.25
Pittsburgh Univ., Pa.
MICROWAVE-OPTICAL DOUBLE RESONANCE (MODR) SPECTROSCOPY OF THE LOWEST TRIPLET STATES OF HALOGENATED BENZENES.
H. J. Yue. Apr 74, 149p

Descriptors: (*Organic halogen compounds, *Spectra), Energy transfer, Excited states, Fine structure, Low temperature, Luminescence, Optical properties, Orbital angular momentum, Orientation, Phosphorescence, Spin, Triplets.

For abstract, see NSA 30 08, number 23355.

IAE-2313 PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii.
STUDY OF THE REACTION OF XENON DIFLUORIDE WITH TRIFLUOROACETIC ACID IN ACETONITROL.
E. L. Duman, and T. I. Yurasova. 1973, 11p
In Russian. U.S. Sales Only.

Descriptors: (*Organic fluorine compounds, *Chemical reactions), (*Xenon fluorides, Chemical reactions), Acetic acid.

For abstract, see NSA 30 08, number 23356.

IS-T-642 PC$10.00/MF$2.25
Ames Lab., Iowa.
POSITIVE ION AND NEUTRAL FRAGMENT MASS SPECTROMETRY OF KETONES.
D. W. Okey. Jul 74, 137p
Contract W-7405-eng-82

Descriptors: (*Ketones, *Mass spectroscopy), Cations, Formation heat, Mass spectra, Neutral particles.

For abstract, see NSA 30 08, number 23359.

IS-3222 PC$8.75/MF$2.25
Ames Lab., Iowa.

ABSORPTION AND EMISSION MIXED CRYSTAL SPECTRA OF SOME AZAAZULENES.
D. R. Eslinger. Jul 74, 112p
Contract W-7405-eng-82

Descriptors: (*Organic chlorine compounds, *Spectra), (*Organic nitrogen compounds, Spectra), Absorption spectra, Azulene, Crystallography, Emission spectra, Fluorescence, Molecules, Optical properties, Polarization, Symmetry.

For abstract, see NSA 30 08, number 23358.

KFKI-74-25 PC$5.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
LIQUID-CRYSTAL CHEMISTRY. II. TRENDS AND RESULTS IN THE PREPARATIVE CHEMISTRY OF LIQUID-METAL COMPOUNDS.
K. Ritvay. May 74, 39p
In Hungarian. U.S. Sales Only.

Descriptors: Azo compounds, Benzene, Benzoic acid, Chemical preparation, Esters, Liquid crystals, Phenyl radicals, Stilbene, Synthesis.

For abstract, see NSA 30 08, number 23362.

LA-5638-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
PROCESS-DEVELOPMENT STUDIES ON 1,5-DIACETYL-3,7-DINITRO-1,3,5,7-TETRAAZACYCLOOCTANE (DADN), AN INTERMEDIATE IN A NEW SYNTHESIS OF HMX.
M. D. Coburn, and T. M. Benziger. May 74, 14p
Contract W-7405-eng-36

Descriptors: (*Chemical explosives, *Synthesis), Acetic acid, Catalysis, Chemical reaction yield, Economics, Formaldehyde, Nitric acid, Oxidation, Processing, Production, Urea, Water.

For abstract, see NSA 30 08, number 23363.

LBL-2383 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
LUMINESCENCE FROM THE PEPTIDE GROUP.
M. Daniels, and M. E. Jayko. Mar 74, 3p CONF-740441-5
Contract W-7405-eng-48

Descriptors: (*Peptides, *Luminescence), Amides, Amino acids, Emission spectra, Ultraviolet radiation.

For abstract, see NSA 30 08, number 23366.

N74-29473/7GA PC$10.25/MF$2.25
Technische Universitaet, Hanover (West Germany).
POLYMERIZATION KINETICS OF STYRENE UNDER HIGH PRESSURE ZUR KINETIK DER POLYMERISATION VON STYROL UNTER HOHEM DRUCK.
Ph.D. Thesis.
A. Helms. 1972, 143p
Language in German.

Descriptors: *Polymerization, *Pressure effects, *Styrenes, *Toluene, Chemical reactions, Reaction kinetics, Thermal diffusivity, Viscosity.

For abstract, see STAR 1219

N74-29476/0GA PC$4.00/MF$2.25
North Dakota State Univ., Fargo. Dept. of Polymers and Coatings.
QUANTITATION OF BURIED CONTAMINATION BY USE OF SOLVENTS.
Semiannual Progress Report, Jul. - Dec. 1973.
S. P. Pappas, Y. C. Hsiao, and L. W. Hill. Dec 73, 14p NASA-CR-139383
Contract NGR-35-001-012

Descriptors: *Amines, *Contamination, *Quantitative analysis, *Silicon polymers, *Solvent extraction, Chemical reactions, Degradation, Depolymerization, Silicone resins, Silicone rubber.

For abstract, see STAR 1219

N74-29477/8GA PC$4.00/MF$2.25
North Dakota State Univ., Fargo. Dept. of Polymers and Coatings.
QUANTITATION OF BURIED CONTAMINATION BY USE OF SOLVENTS.
Semiannual Progress Report, Jan. - Jun. 1974.
S. P. Pappas, Y. C. Hsiao, and L. W. Hill. Jun 74, 9p NASA-CR-139381
Contract NGR-35-001-012

Descriptors: *Contamination, *Materials recovery, *Quantitative analysis, *Silicon polymers, *Solvent extraction, Crosslinking, Reclamation, Silicone resins, Silicone rubber, Solvent extraction.

For abstract, see STAR 1219

ORO-3018-118 PC$4.00/MF$2.25
Louisiana State Univ., Baton Rouge Coates Chemical Labs.
EMISSION CHARACTERISTICS OF CAMPHORQUINONE.
J. F. Arnett, D. B. Larson, and S. P. McGlynn. 10p
Contract AT(40-1)-3018

Descriptors: (*Quinones, *Emission spectra), Camphor, Fluorescence, Low temperature, Luminescence, Medium temperature, Optical properties, Organic compounds, Phosphorescence.

For abstract, see NSA 30 08, number 23372.

PAT-APPL-278 831 PC$3.75/MF$2.25
Department of the Army Washington D C
SYNTHESIS, PURIFICATION AND USE OF THE ASCORBATE SULFATES.
Patent application.
Eugene M. Baker, Bert M. Tolbert, and John E. Halver. Filed 8 Aug 72, 32p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Metabolites, *Vitamins, Molecular structure, Pesticides, Sulfates, Ascorbic acid, Purification, Synthesis(Chemistry), Patents.
Identifiers: *Patent applications, *Ascorbic acid/sulfate.

The patent application describes synthesis, purification and use of ascorbate sulfates. L-xyloascorbate-2-sulfate (Vitamin C2) is a nutritional agent which is a source of and a substitute for L-xyloascorbic acid (Vitamic C). L-xyloascorbate-6-sulfate antimetabolites are useful as a rodent and fish poison and for controlling life in any animal requiring Vitamin C as part of its diet.

PAT-APPL-487 852 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
POLYIMIDES OF ETHER-LINKED ARYL TETRACARBOXYLIC DIANHYDRIDES.
Patent Application.
J. A. Webster. Filed 11 Jul 74, 19p NASA-CASE-MFS-22355
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aerospace systems, *Chemical properties, *Physical properties, *Polyimides, *Sealers, Chemical reactions, *Patent applications, Structures, Thermal stability.

Polyimides with chemical and physical properties that make them useful as sealants in advanced aerospace structures and a procedure for their preparation are presented. The polyimides also have high levels of thermal, oxidative, and hydrolytic stability.

PAT-APPL-489 008 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ETHER-LINKED ARYL TETRACARBOXYLIC DIANHYDRIDES.
Patent Application.
J. A. Webster. Filed 16 Jul 74, 17p NASA-CASE-MFS-22356-1
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Aromatic compounds, *Carboxylic acids, *Dihydrides, Chemical reactions, Imides, *Patent applications, Perfluoro compounds, Sealers.

Dianhydrides were found which when reacted with diamines provide polyimides that exhibit good tensile strength, and excellent thermal, oxidative, and hydrolytic stability. These characteristics make the polyimides useful as sealants in advanced aerospace structures. A formula for the dianhydrides is given and a method for their preparation is presented.

TID-26580 PC$9.25/MF$2.25
Louisiana State Univ., Baton Rouge.
FAR ULTRAVIOLET RYDBERG SPECTRA OF METHYL AND MERCURIC HALIDES.
P. H. Templet. May 74, 124p

Descriptors: (*Mercury chlorides, *Far ultraviolet radiation), (*Mercury bromides, Far ultraviolet radiation), (*Organic halogen compounds, *Spectra), (*Mercury iodides, Spectra), Absorption spectroscopy, Energy resolution, Energy-level transitions, Methyl iodide, Rydberg correction.

For abstract, see NSA 30 08, number 23377.

7D. Physical Chemistry

AD-785 629/7GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
DETECTION AND IDENTIFICATION OF TRACE QUANTITIES OF ORGANIC VAPORS IN THE ATMOSPHERE BY ION CLUSTER MASS SPECTROMETRY AND THE IONIZATION DETECTOR SYSTEM,
Charles S. Harden, and Thomas C. Imeson. 1973, 16p

Descriptors: *Mass spectroscopy, *Gas analysis, Diffusion, Gas ionization, Ions, Gas detectors, Water vapor, Experimental design.
Identifiers: *Ion clusters, Ion molecule interactions.

The use of ion cluster mass spectroscopy for analysis of trace atmospheric contaminants is outlined. Experimental and theoretical aspects are discussed. An ionization detector system is also described.

AD-785 638/8GA PC$3.25/MF$2.25
Army Mobility Equipment Research and Development Center Fort Belvoir Va
INVESTIGATION OF ELECTROCATALYSTS BY LOW ENERGY ELECTRON DIFFRACTION AND RELATED TECHNIQUES,
Johann A. Joebstl, Grayson W. Walker, and William A. Adams. 1973, 13p

Descriptors: *Catalysts, *Fuel cells, Electrochemistry, Electron diffraction.
Identifiers: Hydrocarbon air fuel cells, Low energy electron diffraction.

A realistic candidate for electric power generation is the direct oxidation hydrocarbon/air fuel cell. Its fuel cell reactions only proceed with reasonable reaction rates in the presence of catalysts. The report discusses the use of low energy electron diffraction to study new catalysts.

AD-785 641/2GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
PROPELLANT ANALYSES, NEW APPROACHES, IMPROVED CAPABILITIES,
Arpad A. Juhasz, J. Omar Doali, and Joseph J. Rocchio. 1973, 16p

Descriptors: *Gas chromatography, *Mass spectroscopy, *Chemical analysis, *Liquid propellants, Infrared spectroscopy, Experimental design, Chromatographic analysis.
Identifiers: *Liquid chromatography.

The combined use of high performance liquid chromatography with infrared and mass spectrometry is (HPLC-IR-MS) and gas chromatography-mass spectrometry (GC-MS) is detailed. The application of these methods to the characterization of an unknown propellant sample is presented. Conclusions and recommendations is made concerning their application in other areas of propellant analysis.

AD-785 645/3GA PC$3.25/MF$2.25
Army Mobility Equipment Research and Development Center Fort Belvoir Va
NEW METHOD FOR DETERMINING ADDITIVES AND CONTAMINANTS IN PETROLEUM FUELS,
Marjan Kolobielski. 1972, 15p

Descriptors: *Distillation, *Petroleum products, *Chemical analysis, Gasoline, Diesel fuels, Contaminants, Additives, Flashes, Fuel oil, Residues, Laboratory equipment, Amines, Absorption(Physical).
Identifiers: *Flashing.

The flash distillation method provides in a concentrated form the nonvolatile components present in gasoline, diesel fuel and fuel oil. The concentrate is useful for more detailed analysis to determine the composition of the material. This method also demonstrates the relationship between the absorbance of diesel fuel in the visible region and the concentration of the heavy nonvolatile component in the fuel.

AD-785 777/4GA Reprint
Chicago Univ Ill James Franck Inst
PROPERTIES OF TWO-COMPONENT BIMOLECULAR AND TRIMOLECULAR CHEMICAL REACTION SYSTEMS,
John J. Tyson, and John C. Light. 7 Jun 73, 12p AROD-9751.12-C
Grant DA-ARO-D-31-124-71-G10
Availability: Pub. in the Jnl. of Chemical Physics, v59 n8 p4164-4173, 15 Oct 73.

Descriptors: *Reaction kinetics, Chemical equilibrium, Stability.
Identifiers: Chemical reaction mechanisms.

It is shown that for chemical reaction mechanisms containing only bimolecular steps, which are open to a flow of matter so that there are only two time-dependent concentrations (X and Y), the steady state is either a saddle point, a center, or a stable node or focus. For mechanisms containing trimolecular steps the authors identify two processes which can lead to instability: A + 2X to 3X, and 2X + Y to 3X. The autocatalytic step A + 2X to 3X, where A is maintained at constant concentration, is explosive and it is very hard, if not impossible, to obtain limit cycle oscillations based on such an instability. There already exists a well-characterized mechanism admitting limit cycle oscillations which depend on the destabilizing self-limiting autocatalytic step 2X + Y to 3X, and these results suggest that this is the simplest example of chemical limit cycle oscillations. When the chemical reactions are coupled with diffusive processes, for bimolecular kinetics the nodes and foci are stable. (Modified author abstract)

AD-785 783/2GA Reprint
Kansas State Univ Manhattan Dept of Physics
MULTIPLE INNER-SHELL IONIZATION OF ALUMINUM BY HIGH-VELOCITY MEDIUM-Z BEAMS,
Forrest Hopkins, D. O. Elliott, C. P. Bhalla, and Patrick Richard. 1 Jun 73, 10p AROD-9827.15-P
Grant DA-ARO-D-31-124-71-G185
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Availability: Pub. in Physical Review A, v8 n6 p2952-2959 Dec 73.

Descriptors: *Aluminum, *Atomic orbitals, *Ionization, Atomic beams, Atomic energy levels, Oxygen, Fluorine, Chlorine.

High-resolution studies of aluminum K alpha x rays produced by O, F, and Cl beams at beams energies > or = 1 MeV/amu have been performed with a crystal spectrometer. Fluorescence yields are calculated for the various single K -shell, multiple L -shell vacancy configurations. A simple model of the ionization process has been assumed that allows determination of average 2s and 2p ionization probabilities from the experimental x-ray yields using the calculated fluorescence yields. (Author)

AD-785 784/0GA Reprint
Watervliet Arsenal N Y
ANALYTICAL MODEL FOR SUPER-IDEAL GASES.
Technical rept.,
Y. K. Huang. 29 Jun 73, 11p Rept no. WVT-TR-74042
Availability: Pub. in Foundations of Physics, v4 n2 p207-213 1974.

Descriptors: *Gases, *Equations of state, *Statistical mechanics, Ideal gas law, Numerical analysis.

The equations of state for the ideal classical gas are generalized with two characteristic constants known as the state indices. A simple and complete representation is developed for the super-ideal gas, with explicit results which are general enough to cover a wide range of equilibrium systems and states. Evidence and justification are provided in terms of examples and results of statistical physics. The new model should prove useful for treating problems in involving physical behavior and properties which might otherwise call for specialized or advanced methods of statistical mechanics. (Author)

AD-785 788/1GA Reprint
Northeastern Univ Boston Mass High Pressure Physics Lab
RAMAN SCATTERING IN ANTIFERROELECTRIC AMMONIUM DIHYDROGEN ARSENATE,
R. C. Leung, R. P. Lowndes, and N. E. Tornberg. 20 Aug 73, 6p AROD-10392.7-P
Grant DA-ARO-D-31-124-72-G125
Availability: Pub. in the Jnl. of Chemical Physics, v60 n3 p780-783, 1 Feb 74.

Descriptors: *Raman spectra, Crystals, Polarization, Molecular vibration, Arsenic compounds, Ammonium compounds, Spectrum analysis.
Identifiers: *Ammonium arsenates, Lattice vibrations.

Light scattering measurements of the Raman active modes of vibration in the range 10-4000/cm are reported for the paraelectric phase of NH4H2AsO4 in the temperature range 220-295 K. Through examination of these spectra we have identified the protonic, transverse optic, internal, and O-H-O valence vibrations and determined their symmetries. (Author)

AD-785 789/9GA Reprint
National Bureau of Standards Washington D C Inst for Materials Research
PHOTODISSOCIATIVE FORMATION OF ION PAIRS FROM MOLECULAR HYDROGEN AND THE ELECTRON AFFINITY OF THE HYDROGEN ATOM,
K. E. McCulloh, and James A. Walker. 11 Jan 74, 6p AROD-10831.2-C
Sponsored in part by National Aeronautics and Space Administration, Washington, D.C.
Availability: Pub. in Chemical Physics Letters, v25 n3 p439-442, 1 Apr 74.

Descriptors: *Photodissociation, *Hydrogen, *Photoionization, Deuterium, Far ultraviolet radiation.
Identifiers: *Electron affinity, Hydrogen atoms.

Photodissociative production of ion pairs from H2 has been observed in the wavelength range 706-718 A. From measured thresholds for production of H(-) from H2 molecules in each of the three lowest rotational states, the lower bound electron affinity (EA) for H atoms is obtained, in excellent agreement with the theoretical electron affinity. For formation of D(-) from D2, a threshold assigned to molecules in the rotational state J = 2 has been measured, from which the bound EA(D) is obtained. Negative ion yield curves are presented for hydrogen. (Modified author abstract)

AD-785 791/5GA Reprint
New York Univ N Y Dept of Physics
BROWNIAN MOTION OF ATOMIC SYSTEMS: FOKKER-PLANCK LIMIT OF THE TRANSPORT EQUATION,
Paul R. Berman. 12 Nov 73, 10p AROD-10895.2-P
Grant DA-ARO-D-31-124-73-G128
Availability: Pub. in Physical Review A, v9 n5 p2170-2177 May 74.

Descriptors: *Kinetic theory, *Brownian motion, Atoms, Molecules, Statistical mechanics, Boltzmann equation.
Identifiers: Fokker-Planck equation.

A comparison is made between the Fokker-Planck equation (FPE) and the transport equation (TE) solutions of the problem of the collisional relaxation of an atomic or molecular system undergoing Brownian motion. It is shown that, for times < or = (inverse collision rate), the FPE does not provide an appropriate approximation to the TE if the velocity bandwidth of the initially prepared sample is less than the root-mean-square change in velocity per collision. Possible experimental verification of the theory using laser-pump sources to provide narrow initial-velocity distributions is discussed. (Author)

AD-785 792/3GA Reprint
Yale Univ New Haven Conn
CROSS SECTIONS FOR PRODUCTION OF O2(-) AND C(-) BY DISSOCIATIVE ELECTRON ATTACHMENT IN CO2: AN OBSERVATION OF THE RENNER-TELLER EFFECT,
D. Spence, and G. J. Schulz. 8 Jun 73, 7p AROD-7091.17-P
Grant DA-ARO-D-31-124-72-G40
Prepared in cooperation with Argonne National Lab., Ill.
Availability: Pub. in Jnl. of Chemical Physics, v60 n1 p216-220, 1 Jan 74.

Descriptors: *Carbon dioxide, *Electron capture, *Dissociation, Electron beams, Gas ionization, Cross sections, Electron energy, Molecular energy levels, Anions.

Using monoenergetic electron beams and mass analysis, the authors have measured the cross sections for production of O2(-) and C(-) by dissociative attachment in CO2. The cross section for O2(-) production has two peaks. The double peaked nature of the cross section is interpreted as a manifestation of the Renner-Teller effect. The positions of these two peaks are in good agreement

with INDO calculations. The cross section for C(-) production has three peaks. (Modified author abstract)

AD-785 795/6GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
ELECTRONIC ABSORPTION AND EMISSION SPECTRAL STUDIES OF SQUARE-PLANAR RH(I) AND TR(I) COMPLEXES. EVIDENCE FOR A CHARGE-TRANSFER EMITTING STATE,
Gregory L. Geoffroy, Mark S. Wrighton, George S. Hammond, and Harry B. Gray. 3 Oct 73, 6p
Rept no. Contrib-4767 AROD-8389.12-C
Grant ARO-D-31-124-72-G116
Prepared in cooperation with California Univ., Santa Cruz. Div. of Natural Sciences and Massachusetts Inst. of Tech., Cambridge. Dept. of Chemistry. Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in Jnl. of the American Chemical Society, v96 n10 p3105-3108, 15 May 74.

Descriptors: *Metal complexes, *Rhodium compounds, *Iridium compounds, *Charge transfer, Absorption spectra, Phosphines, Molecular energy levels, Visible spectra, Ultraviolet spectra, Emission spectra, Electron transitions, Spectrum analysis, Molecular structure.

Absorption and emission spectra for the square-planar complexes (Rh(2-phos)2)Cl, (Rh(2=phos)2)Cl, (Ir(2-phos)2)Cl, and(Ir(2=phos)2)Cl(2-phos is 1,2-bis(diphenylphosphino)ethane; 2=phos is cis-1,2-bis(diphenylphosphino)ethylene) have been measured in the solid state and in frozen EPA (ethyl ether-isopentane-ethyl alcohol (5:5:2)) solution at 77K. It is suggested that in the Ir(I) cases emission occurs from a square-planar d7 a(2u) charge-transfer state of E(u)(triplet A(2u)) symmetry. The fact that the emission maxima of the two Rh(I) complexes are both red-shifted by about 4000 cm from the lowest absorption peak is discussed in terms of an admixture of d-d character in the primarily d7 a(2u) emitting state, which could give rise to a distortion of the RhP4 core toward tetrahedral geometry. (Modified author abstract)

AD-785 805/3GA Reprint
State Univ of New York Stony Brook Dept of Chemistry
LEAST-SQUARES INTEGRATION METHOD IN INTENSITY FLUCTUATION SPECTROSCOPY OF MACROMOLECULAR SOLUTIONS WITH BIMODAL DISTRIBUTIONS,
S. P. Lee, and B. Chu. 17 Dec 73, 5p AROD-8014.20-C
Grant DA-ARO-D-31-124-73-G30
Availability: Pub. in Applied Physics Letters, v24 n6 p261-263, 15 Mar 74.

Descriptors: *Least squares method, *Spectrum analysis, Polymers, Chemical equilibrium, Exponential functions, Time dependence, Decay, Reaction kinetics, Intensity, Variations, Correlation techniques.

The letter presents a new least-squares integration method of analysis for time-dependent correlation functions consisting of two exponentials. It also contains an investigation of the effect of sample time on the accuracy that can be achieved in a given intensity correlation measurement by means of 24- and 48-channel single-clipped photon-correlation spectrometers. Comparison is made with the least-squares normal equation method using experimental as well as simulated results. (Modified author abstract)

AD-785 811/1GA Reprint
Hunter Coll New York
TOPICS IN CHEMICAL INSTRUMENTATION. LXXVI. LABORATORY AUTOMATION--A CASE HISTORY,
Bernard J. Bulkin, Edward H. Cole, and Arthur Noguerola. 1974, 9p AROD-8646.7-C
Grant DA-ARO-D-31-124-73-G97
Availability: Pub. in Jnl. of Chemical Education, v51 n5 May 74 (A273).

Descriptors: *Raman spectroscopy, *Spectrometers, *Automation, Interfaces, Data processing, Automatic, Computer programming, Data reduction, Data acquisition.

The authors discuss a case history of laboratory automation. The instrument which is described is an automated Raman spectrometer. The discussion presents a rationale for selection of the equipment to be used. Following that the interfaces and related hardware are explained in detail. The programs or software are discussed.

AD-785 899/6GA PC$3.25/MF$2.25
Utah Univ Salt Lake City Dept of Chemistry
BRILLOUIN SCATTERING OF LIGHT IN A CHOLESTERIC LIQUID CRYSTAL.
Technical rept.,
C. H. Wang, and Y. Y. Huang. 17 Sep 74, 13p Rept no. TR-8
Contract N00014-67-A-0325-0007

Descriptors: *Liquid crystals, *Cholesterol, *Acoustic properties, Phase transformations, Acoustic attenuation, Acoustic velocity, Brillouin zones, Light scattering.
Identifiers: *Brillouin scattering, Palmitates, Hypersonic radiation.

Brillouin scattering was used to study the hypersonic properties of cholesteryl palmitate in the liquid crystal-liquid phase transition region. Contrary to the results of similar measurements by Durand and Rao, no anomalous change in either the velocity or the attenuation of the hypersonic waves was observed at the transition. (Author)

AD-785 913/5GA PC$3.25/MF$2.25
Washington Univ Seattle Lab for Chemometrics
STRUCTURE-REACTIVITY CORRELATIONS FOR ORGANIC MOLECULES BY PATTERN RECOGNITION.
Interim rept. Apr-Aug 74,
J. R. Koskinen, and B. R. Kowalski. Aug 74, 15p
Rept no. TR-5
Contract N00014-67-A-0103-0036
See also AD-784 391.

Descriptors: *Benzoic acids, *Hydrolysis, *Molecular structure, *Pattern recognition, Stereochemistry, Electronic states, Reaction kinetics.
Identifiers: *Chemical reactivity.

Pattern recognition is used to predict the relative reactivity of a molecule from its structural features. For this preliminary study the hydrolysis of substituted benzoic acids was selected as the model reaction system. Nine structurel features of seventy-nine ortho, meta, or para substituted benzoic acids were input to a master program of pattern recognition methods. These methods were 96.2% accurate in predicting the relative reactivity of the substituted acids. The features that describe the electronic structure of the substituent and its position on the aromatic ring were found to be more important for predicting the rate than the features that describe the steric size of the substituent. (Author)

AD-785 918/4GA Reprint
California Univ Santa Barbara Dept of Physics
GAS-PHASE REACTION OF BARIUM WITH DINITROGEN OXIDE. I. MEASUREMENT OF PRODUCTION EFFICIENCY OF EXCITED STATES,
C. R. Jones, and H. P. Broida. 28 Jan 74, 11p
AFOSR-TR-74-1485
Grant AF-AFOSR-1851-70
See also AD-785 919.
Availability: Pub. in the Jnl. of Chemical Physics, v60 n11 p4369-4376, 1 Jun 74.

Descriptors: *Barium, *Chemiluminescence, Molecular vibration, Molecular energy levels, Yield, Nitrogen oxides, Reaction kinetics, Oxidation.
Identifiers: *Nitrogen oxide(N2O), Barium oxides.

Photon yields for the reaction of Ba with N2O are determined by observing chemiluminescence from flames in a rapid flow of buffer gas. The yield for BaO A-X photons is strongly dependent on inert-gas pressure and is measured to be 20% at pressures near 10 torr. Also at this pressure, the specific yield for production of BaO A-state molecules in a single vibrational level, v=1, is found to have the surprisingly large value of 8%. The vibrational distribution of BaO A singlet sigma molecules in the flame is found to be a strong function of oxidizing reactant and buffer-gas pressure. A kinetic scheme accounting for gross features of the observations is presented. (Author)

AD-785 919/2GA Reprint
California Univ Santa Barbara Dept of Physics
GAS-PHASE REACTION OF BARIUM WITH DINITROGEN OXIDE. II. MECHANISM OF REACTION,
R. W. Field, C. R. Jones, and H. P. Broida. 28 Jan 74, 8p AFOSR-TR-74-1486
Grant AF-AFOSR-1851-70
See also AD-785 918.
Availability: Pub. in Jnl. of chemical physics, v60 n11 p4377-4382, 1 Jun 74.

Descriptors: *Barium, *Chemiluminescence, *Oxidation, Chemical lasers, Excitation, Vapor phases, Nitrogen oxides, Molecular energy levels, Reaction kinetics, Electronic states.
Identifiers: *Nitrogen oxide(N2O), Chemical reaction mechanisms.

A reaction mechanism and a correlation diagram argument are presented to account for the high photon yield of the chemiluminescent reaction of Ba Atoms with N2O. Most BaO molecules appear to be formed initially in the long-lived a triplet Pi state and to be transferred subsequently by collisions into the shorter-lived A singlet Sigma state. This mechanism accounts for numerous kinetic and spectroscopic observations of BaO. The arguments suggest that reactions of alkaline earth atoms with N2O and with O3 may be suitable for electronic-transition chemical lasers. (Author)

AD-785 923/4GA Reprint
Washington Univ Seattle Dept of Physics
WORK-FUNCTION VARIATION WITH ALLOY COMPOSITION: AG-AU.
Interim rept.,
S. C. Fain, Jr., and J. M. McDavid. 11 Feb 74, 12p
AFOSR-TR-74-1492
Grant AF-AFOSR-1967-71
Availability: Pub. in Physical Review B, v9 n12 p5099-5107, 15 Jun 74.

Descriptors: *Silver alloys, *Gold alloys, *Work functions, Auger electron spectroscopy, Surface properties, Composition(Property), Oxygen, Adsorption, Crystal structure.

Auger electron spectroscopy has been used in situ to characterize the surfaces of evaporated silver-gold alloy films grown epitaxially on heated mica ((111) orientation). The films were shown to be free of any detectable surface impurities. The known energy dependence of the electron escape depth in these metals was used to show that the alloy films had the same surface and bulk composition. The surface composition was determined by comparing Auger signals from the alloys with signals from pure metal reference standards evaporated simultaneously with the alloys. An electron-beam retarding potential method using the electron gun of the Auger spectrometer was used to determine the difference in work function between the alloys and the references. The measurements showed that the work functions of these alloys fall significantly below a linear inter-

polation between the values for the two pure materials. The change in work function with oxygen adsorption was found to be not linear in surface composition. (Author)

AD-785 933/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
STATIONARY POTENTIALS AND ANODIC POLARIZATION OF PLATINUM AND PALLADIUM IN A MOLTEN EUTECTIC MIXTURE OF ALKALI METAL CARBONATES,
I. N. Ozeryanaya, T. I. Manukhina, and M. V. Smirnov. 24 Dec 73, 8p Rept no. FSTC-HT-23-1344-73
Trans. of Akademiya Nauk SSSR. Uralskii Filial, Sverdlovsk. Institut Elektrokhimii. Trudy, n17 p77-81 1971.

Descriptors: *Platinum, *Palladium, *Anodic polarization, Fused salts, Temperature, Oxygen, Eutectics, USSR, Translations, Carbonates, Adsorption, Surfaces, Passivity, Electrochemistry, Electrodes.
Identifiers: *Electric potential.

The temperature relationships of the stationary potentials of platinum and palladium in molten eutectic mixtures of alkali metal carbonates, with a carbon dioxide atmosphere over the melt, was studied in the temperature range 600-800C. It was shown that, during anode polarization of platinum and palladium under the same conditions, together with some dissolving of the metals, absorption of oxygen given off by discharge of the carbonate anions takes place on their surfaces. This oxygen passivates the electrode from further dissolving.

AD-785 945/7GA PC$5.25/MF$2.25
Virginia Univ Charlottesville Dept of Engineering Science and Systems
ATOMIC INTERACTIONS BASIC TO MACROSCOPIC PROPERTIES OF BASES.
Final rept. 1 Sep 70-28 Feb 73,
J. E. Scott, Jr. Jul 74, 109p Rept no. ESS-3440-101-74 ARL-74-0103
Contract F33615-69-C-1048

Descriptors: *Particle collisions, *Energy transfer, Atomic beams, Differential cross sections, Scattering cross sections, Transport properties, Photoionization, Charge transfer, Inelastic scattering, Molecular beams, Ion beams, Electron capture, X rays, Molecular energy levels, Atomic energy levels, Experimental design.
Identifiers: Atom ion interactions, Atomic scattering.

A final report of effort on a comprehensive research program on atomic and molecular collision processes, in which the microscopic aspects of various collision events are studied both from the theoretical and experimental points of view, is described. Particular emphasis is placed on the manner in which these processes determine the macroscopic properties of gases; e.g., the transport properties of gases at high temperature, and the manner in which energetic radiation interacts with matter. A report on the progress on each of the six research tasks comprising a unified program based on experimental methods using atomic, ionic, and molecular beam methods and on the use of many-body perturbation theory and atomic interaction potentials for the calculation of atomic and molecular properties, scattering cross sections and transport properties of high temperature gases, is presented. (Modified author abstract)

AD-785 971/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
USE OF A CYCLOTRON TO STUDY THE RADATION CHEMISTRY OF SOLIDS,
A. N. Oblivantsev, V. M. Lykhin, and L. P. Eremin. 7 Oct 73, 9p Rept no. FSTC-HT-23-913-73
Trans. of Politekhnicheskii Institut, Tomsk. Izvestiya (USSR) v176 p116-121 1970.

Descriptors: *Radiation chemistry, *Alkali metal compounds, *Cyclotrons, Ionizing radiation, Protons, Translations, USSR.

During the last five years, work has been performed using the cyclotron of the Scientific Research Institute of Nuclear Physics at the TPI, to study the radio-chemical stability of ionized crystals under the action of a proton beam escaping into the atmosphere. As target, azides, nitrates, perchlorates and permanganates of alkali metals were used.

AD-785 994/5GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
RADIOSPECTROSCOPIC STUDY OF RADICAL FORMS OF ADSORBED OXYGEN,
V. B. Kazanskii. 22 Aug 74, 20p Rept no. FTD-MT-24-1753-74
Edited machine trans. of mono. Problemy Kinetiki i Kataliza. XV. Mekhanism i Kinetika Geterogennykh Reaktsii, n.p., 1973 p77-84, by Frank C. Vaughn.

Descriptors: *Oxygen, *Catalysts, *Adsorption, *Chemical radicals, Translations, Electron paramagnetic resonance, Spectrum analysis, Ions, Surface chemistry, USSR.

The report discusses the formation of adsorbed oxygen radicals (e.g. O(-), O2(-)) on the surfaces of oxidation catalysts. Electron paramagnetic resonance spectra are used to analyze mechanisms and surface processes.

AD-786 003/4GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
VALUE OF THE LOCAL AND COLLECTIVE ELECTRONIC PROPERTIES OF MODIFIED TIO2 IN REACTIONS OF THE OXIDATION OF CARBON MONOXIDE AND OF THE DECOMPOSITION OF ISOPROPYL ALCOHOL AND FORMIC ACID,
N. P. Keer, I. S. Sazonova, I. L. Mikhailova, and T. P. Khoklova. 29 Aug 74, 18p Rept no. FTD-MT-24-1752-74
Edited machine trans. of mono. Problemy Kinetiki i Kataliza. XV. Mekhanizm i Kinetika Geterogennykh Reaktsii, n.p., 1973 p71-77, by Frank C. Vaughn.

Descriptors: *Titanium oxides, *Catalysts, *Surface chemistry, Carbon monoxide, Propanols, Electronic states, Decomposition, Formic acid, USSR, Translations, Oxidation, Activation energy, Chemisorption, Additives.
Identifiers: Chemical reaction mechanisms.

The report discusses the surface chemistry of titanium dioxide in regards to its catalysis of carbon monoxide oxidation and formic acid and isopropyl alcohol decomposition. The surface electronic structure is the basis of the analysis.

AD-786 021/6GA PC$5.75/MF$2.25
Technology Inc Dayton Ohio
NUMERICAL CALCULATIONS OF UV EMISSION AND ABSORPTION SPECTRA OF OH.
Final rept. 1 Mar 72-1 Mar 73,
Michael E. Neer. Aug 74, 147p ARL-74-0109
Contract F33615-71-C-1463

Descriptors: *Hydroxyl radicals, *Ultraviolet spectra, Computer programs, Emission spectra, Electron transitions, Absorption spectra, Molecular energy levels, Molecular vibration, Molecular rotation, Combustion, Mixing, Molecular spectroscopy, Mathematical models, Temperature.

The report presents the details and uses of a computer program designed to predict the ultraviolet emission and absorption spectra of OH associated with combustor flowfields. The intended purpose of the computer program is to facilitate the development of spectroscopic diagnostic techniques for specific application to supersonic mixing and combustion. The mathematical models used to represent the emitting and absorbing gas are given. Geometry and apparatus considerations are discussed, as well as calibration procedures. The computation scheme is outlined including the basic modes of operation, and the manner in which input data are submitted is explained. The various uses of the computer program are demonstrated and comparisons are made with experimental spectra. Two graphical inversion techniques are also presented, one of which can be used to obtain radial profiles of temperature and OH number density from an axisymmetric combustor flowfield. A listing of the computer program and a partial printout are included.

AD-786 026/5GA PC$4.25/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
MEASUREMENT OF THE RATE OF DISSOCIATIVE ATTACHMENT OF ELECTRONS TO FLUORINE IN A FLOWING AFTERGLOW SYSTEM.
Interim technical rept. Jan 73-Jan 74,
Gary D. Sides, and Thomas O. Tiernan. Jul 74, 70p Rept no. ARL-74-0105

Descriptors: *Fluorine, *Electron capture, *Dissociation, Experimental design, Afterglows, Gas ionization, Gas flow, Rates, Charge transfer.
Identifiers: Sulfur hexafluoride, Electron molecule interactions, Ion molecule interactions.

The dissociative attachment of low energy electrons to fluorine is a potential source of fluorine atoms in electrically initiated hydrogen-fluorine chemical laser systems. The ARL flowing afterglow system was developed to measure the rate of this reaction. Electrons are produced in a microwave discharge and react with fluorine, and the resulting negative ions are sampled through an orifice at the end of a reaction channel. Two other reactions were also studied in the process of developing the experimental technique: the charge transfer reaction between diatomic negative oxygen ion and sulfur hexafluoride and electron attachment to sulfur hexafluoride. (Modified author abstract)

AD-786 059/6GA Reprint
Intelcom Rad Tech San Diego Calif
ASSOCIATIVE AND REARRANGEMENT IONIZATION IN COLLISIONS OF METASTABLE HELIUM WITH H2,
R. H. Neynaber, and G. D. Magnuson. 29 Mar 74, 3p Rept no. RT-8103-003
Contract N00014-74-C-0011
Availability: Pub. in Jnl. of Chemical Physics, v61 n2 p749-750, 15 Jul 74.

Descriptors: *Helium, *Hydrogen, *Gas ionization, Metastable state, Particle collisions, Cross sections, Atomic energy levels.
Identifiers: Atom molecule interactions, Rearrangement reactions.

In a continuing effort to look at the role of the relative kinetic energy of motion of reactants W in chemi-ionization reactions from near thermal to higher energies, the authors have used merging beams to measure relative and absolute cross sections for the exothermic, associative ionization (AI) reaction He(*) + H2 to HeH2(+) + e, where He(*) represents either He (2 singlet S) or He(2 triplet S).

AD-786 068/7GA Reprint
Pennsylvania State Univ University Park Dept of Chemistry
VAPOR PRESSURE AND THERMODYNAMICS OF SELENIUM DIOXIDE. THE ENTHALPY OF ATOMIZATION OF SEO2(G),
Robert G. Behrens, Richard S. Lemons, and Gerd M. Rosenblatt. 16 Aug 73, 12p AROD-4847.24-C
Grant DA-ARO-D-31-124-72-G91
Revision of report dated 11 May 73.

Availability: Pub. in Jnl. of Chemical Thermodynamics, v6 p457-466 1974.

Descriptors: *Selenium compounds, *Vapor pressure, Thermodynamics, Selenium, Copper ores, Roasting.
Identifiers: Selenium oxides.

The equilibrium vapor pressures and thermochemical properties of selenium dioxide are of practical importance to the non-ferrous metals industry since a major portion of the world's supply of metallic selenium is obtained as SeO2 in the oxidative roasting of anode slimes which are a by-product of the electrolytic refining of copper. The present paper presents new measurements of the vapor pressure of SeO2 at low temperatures by the mass-loss effusion method.

AD-786 069/5GA Reprint
North Carolina State Univ Raleigh Dept of Chemistry
ELECTROCHEMISTRY OF RHODIUM-DIPYRIDYL COMPLEXES,
Gregory Kew, Keith DeArmond, and Kenneth Hanck. 6 Aug 73, 10p AROD-8724.3-C
Grant DA-ARO-D-31-124-70-G56
Availability: Pub. in Jnl. of Physical Chemistry, v78 n7 p727-734 1974.

Descriptors: *Rhodium compounds, *Metal complexes, *Electrochemistry, Charge transfer, Luminescence, Reduction(Chemistry), Pyridines, Polarographic analysis.
Identifiers: Cyclic voltammetry, *Bipyridines.

Voltammetric data have been obtained for 2,2'-dipyridyl (dip) complexes of rhodium in acetonitrile. A reaction sequence is proposed based on analysis of electrochemical and luminescence data. For (Rh(dip)3)(3+), the first one-electron reduction is followed by moderately fast elimination of one dip ligand. A second, apparently reversible, one-electron transfer which produces a Rh(I) species is also followed by a chemical reaction. Two more stepwise, reversible one-electron transfers yield (Rh(dip)2)0 and (Rh(dip)2)(-) successively. Reactions for (Rh(dip)2Cl2(+) exactly parallel to those found for the tris dip complex except chloride is eliminated following the first electron transfer. (Modified author abstract)

AD-786 071/1GA Reprint
Kansas State Univ Manhattan Dept of Chemistry
QUENCHING CROSS SECTIONS FOR XE(TRIPLET P2) METASTABLE ATOMS WITH SIMPLE MOLECULES,
J. E. Velazco, and D. W. Setser. 22 Nov 73, 6p AROD-9503.9-C
Grant DA-ARO-D-31-124-71-G127
Availability: Pub. in Chemical Physics Letters, v25 n2 p197-200, 15 Mar 74.

Descriptors: *Xenon, *Quenching(Inhibition), Metastable state, Afterglows, Cross sections, Atomic energy levels.
Identifiers: Atom molecule interactions.

The cross section for quenching of Xe(3P2,8.3 eV) metastable atoms by thirteen simple molecules has been measured using the flowing-afterglow technique. Except for H2 and N2, the cross sections for quenching of Xe(triplet 2) are larger than for quenching of Ar(3 triplet P2). For both Ar(triplet P2) and Xe(triplet P2) the magnitude of the quenching cross section for the majority of the molecules is dominated by long range forces. The technique used for generating Xe(triplet P2) was based upon the addition of Xe to a flow of argon metastable atoms which results in the transfer of energy from a large fraction of Ar metastable atoms to ground state Xe atoms, yielding Xe(triplet P2) atoms. (Modified author abstract)

AD-786 073/7GA Reprint
Naval Research Lab Washington D C
PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON X-RAY PROCESSES IN MATTER HELD AT HELSINKI UNIVERSITY OF TECHNOLOGY, OTANIEMI, FINLAND, ON JULY 28-AUGUST 1, 1974,
R. C. Elton. Jul 74, 7p
Availability: Pub. in Physica Fennica, v9 Sup S1 p397-402 Jul 74.

Descriptors: *X rays, Electron transitions, Gas lasers, Atomic energy levels.
Identifiers: *X ray lasers.

Two articles briefly discuss quasi-stationary inversion on K alpha transitions and towards X-ray lasers with VUV amplification on 3p to 3s transitions.

AD-786 075/2GA Reprint
Cornell Univ Ithaca N Y School of Applied and Engineering Physics
ADSORPTION OF SINGLE ALKALI ATOMS ON TUNGSTEN USING FIELD EMISSION AND FIELD DESORPTION,
Thor N. Rhodin. 25 Sep 73, 32p AROD-8961.10-MC
Grant DA-ARO-D-31-124-71-G56
Revision of report dated 2 Apr 73.
Availability: Pub. in Surface Science, v42 p109-138 1974.

Descriptors: *Adsorption, *Tungsten, *Alkali metals, Dipole moments, Field emission.
Identifiers: Binding energy.

Single adatom events have been detected and the binding energies and dipole moments of single sodium, potassium and cesium adatoms have been measured on the (110), (112) and (111) planes of tungsten in a probe hole field emission microscope. The Fowler-Nordheim formulation has been modified to include averaging effects implicit in probe hole measurements on single adsorbed atoms. The work function changes and consequent dipole moments associated with single alkali adatoms on a tungsten surface have been estimated. A model has been proposed to obtain binding energies from measurements of the field required to desorb a single alkali adatom. The results are in good agreement with current theoretical predictions for the adsorption of single alkali atoms on metals. (Author)

AD-786 083/6GA Reprint
Wayne State Univ Detroit Mich Dept of Chemistry
ELECTRON PARAMAGNETIC RESONANCE AND ELECTRON-NUCLEAR DOUBLE RESONANCE LINE SHAPE STUDIES OF TRAPPED ELECTRONS IN GAMMA-IRRADIATED DEUTERIUM-SUBSTITUTED 10 M SODIUM HYDROXIDE ALKALINE ICE GLASS,
John Helbert, Larry Kevan, and Barney L. Bales. 27 Aug 73, 13p AROD-9999.11-C
Grant DA-ARO-D-31-124-71-G180
Prepared in cooperation with California State Univ., Northridge. Dept. of Physics and Astronomy.
Availability: Pub. in The Jnl. of Physical Chemistry, v78 n3 p221-231 1974.

Descriptors: *Electron paramagnetic resonance, *Ice, Spectrum analysis, Sodium hydroxide, Electrons, Glass, Radiolysis, Interactions, Deuterium compounds, Spectral lines.
Identifiers: Matrix isolation techniques, *Trapped electrons, *Electron nuclear double resonance.

The epr and endor line widths and line shapes for the trapped electron produced by gamma-irradiation in alkaline ice glasses at 77K have been studied both theoretically and experimentally as a function of matrix deuteration. The theoretical model is based on the trapped electron e(-) interacting equivalently with n nearest neighbor protons and deuterons. The interactions considered include (a) dipolar contributions between e(-) and other radicals, (b) dipolar contributions between e(-) and alkali metal nuclei, (c) dipolar interactions between e(-) and nonnearest neighbor protons and deuterons, (d) dipolar interactions between e(-) and nearest neighbor protons and deuterons, and (e) Fermi contact interactions with nearest neighbor protons and deuterons. A simple theoretical model suggests that at slower freezing rates there is a preference for OH over OD bond orientation toward e(-). (Modified author abstract)

AD-786 090/1GA Reprint
California Univ Santa Barbara Dept of Chemistry
THE ACTIVATION OF YTTRIA, LUTETIA, AND YTTERBIA FOR THE ORTHO-PARAHYDROGEN CONVERSION,
J. A. Arias, and P. W. Selwood. 29 Nov 73, 8p AROD-6799.16-C
Grant DA-ARO-D-31-124-73-G209
Availability: Pub. in Jnl. of Catalysis, v33 no. 2 p284-288 May 74.

Descriptors: *Yttrium oxides, *Surface properties, Crystal structure, Hydrogen, Activation, Phase transformations, Electronic states, Surface chemistry, Water, Ytterbium compounds, Lutetium compounds, Oxides.
Identifiers: *Ytterbium oxides, *Lutetium oxides, Orthohydrogen, Parahydrogen.

The diamagnetic oxides Y2O3 and Lu2O3 may be activated for the p-H2 conversion by heating them in H2 between 823 and 973K. This pretreatment appears to generate the ions Y(2+) and Lu(2+), respectively. From the quantity of water formed during the activation it is possible to estimate the surface concentration of paramagnetic sites. By combining this information with the specific conversion rates it is possible to obtain the net conversion rate per active site. The results are in agreement, to about one order, with recent theoretical calculations of the absolute rates. From conversion rate studies over Lu2O3 and Yb2O3 and from extrinsic field studies, it is concluded that heating Yb2O2 in H2, and possibly other rare earths in the C crystallographic form, causes surface reactions resulting in a (4f)n(Sd)0 to (4f)n(5d)1 electronic change. (Modified author abstract)

AD-786 096/8GA Reprint
State Univ of New York Stony Brook Dept of Chemistry
EXPERIMENTAL EVALUATION OF MACROMOLECULAR POLYDISPERSITY IN INTENSITY CORRELATION SPECTROSCOPY USING THE CUMULANT EXPANSION TECHNIQUE,
F. C. Chen, W. Tschornuter, D. Schmidt, and B. Chu. 9 Oct 73, 4p AROD-8014.21-C
Grant DA-ARO-D-31-124-73-G30
Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in The Jnl. of Chemical Physics, v60 n4 p1675-1676, 15 Feb 74.

Descriptors: *Macromolecules, *Polystyrene, Dispersions, Particle size.
Identifiers: *Polydispersity, Intensity fluctuation spectroscopy.

Most macromolecules are polydisperse. Intensity fluctuation spectroscopy has been proposed as a possible rapid technique for measuring macromolecular polydispersity in solution. The authors evaluate the cumulant expansion technique using a bimodal distribution of polystyrene latex spheres under state of the art experimental conditions so that its practical limitations can be assessed. (Modified author abstract)

AD-786 098/4GA Reprint
Texas Univ Austin Dept of Chemistry
THE PRODUCTION OF SINGLET OXYGEN IN ELECTROGENERATED RADICAL ION ELECTRON TRANSFER REACTIONS,
Edward A. Mayeda, and Allen J. Bard. 29 Jan 73, 6p AROD-8352.14-C
Grants DA-ARO-D-31-124-73-G34, NSF-GP-31414

Availability: Pub. in Jnl. of the American Chemical Society, v95 p6223-6226, 19 Sep 73.

Descriptors: *Superoxides, *Ferrocenes, *Change transfer, *Electrolysis, Oxidation, Oxygen, Electrochemistry, Pulses, Reduction(Chemistry), Ions, Quenching(Inhibition).

The electrochemical reduction of oxygen generated superoxide ion and the electrochemical oxidation of ferrocene yielded the ferricenium ion. Both of these ion radicals were produced alternately in the same solution by pulsing the electrode potential between the reduction potential of oxygen and the oxidation potential of ferrocene. The homogeneous electron transfer reaction between superoxide ion and the ferricenium ion then produced ferrocene and singlet oxygen. The intermediacy of singlet oxygen and demonstrated by chemical quenching with 1,3-diphenylisobenzofuran (DPBF) which produced o-dibenzoylbenzene (DBB). The electron transfer reaction between superoxide and DPBF cation radical also produced singlet oxygen. (Author)

AD-786 104/0GA Reprint
Wisconsin Univ Madison Dept of Chemistry
ESTIMATION OF LONG-CHAIN BRANCHING IN ETHYLENE-PROPYLENE TERPOLYMERS FROM INFINITE-DILUTION VISCOELASTIC PROPERTIES,
Yutaka Mitsuda, John L. Schrag, and John D. Ferry. 7 May 73, 12p AROD-9479.12-C
Grant DA-ARO-D-31-124-73-G48
Sponsored in part by National Institutes of Health, Bethesda, Md. and National Science Foundation, Washington, D.C.
Availability: Pub. in Jnl. of Applied Polymer Science, v18 p193-202 1974.

Descriptors: *Polymers, *Solutions(Mixtures), Viscoelasticity, Molecular weight, Dilution.
Identifiers: NTISNIH NTISNSF, Ethylene propylene terpolymers, Ethylene copolymers, Propylene copolymers.

A method is outlined for estimation of small degrees of long-chain branching in polymers with moderately narrow molecular weight distribution. The storage and loss shear moduli, G' and (G double prime), are measured in dilute solution by the Birnboim-Schrag multiple-lumped resonator and extrapolated to infinite dilution, choosing a suitable solvent viscosity and frequency range such that the data lie in the terminal zone where G' and (G double prime) are proportional to the second and first powers of frequency, respectively. The intrinsic reduced steady-state shear compliance is determined from these data and corrected for moderate molecular weight heterogeneity (assuming a Gaussian distribution). The method has been illustrated by measurements on four ethylene-propylene copolymers. One containing no termonomer and one containing a saturated termonomer appeared to be linear; two containing unsaturated termonomers showed small degrees of branching. The method appears to be promising for detecting from one to four branch points per molecule. (Modified author abstract)

AD-786 106/5GA Reprint
Kansas State Univ Manhattan Dept of Physics
K-SHELL AUGER RATES, TRANSITION ENERGIES, AND FLUORESCENCE YIELDS OF VARIOUSLY IONIZED STATES OF ARGON,
C. P. Bhalla. 4 May 73, 8p AROD-9827.17-P
Grant DA-ARO-D-31-124-71-G185
Sponsored in part by Stichting voor Fundamenteel Onderzoek der Materie, Amsterdam (Netherlands). Instituut voor Atoom en Molecuulfysica.
Availability: Pub. in Physical Review A, v8 n6 p2877-2882 Dec 73.

Descriptors: *Atomic orbitals, *Auger electrons, Ionization, Wave functions.
Identifiers: Atom ion interactions.

Theoretical K-shell Auger groups rates, K alpha and K beta x-ray rates, and fluorescence yields are presented for 47 defect electronic configurations of argon. Energy shifts from the normal x rays and the Auger-electron energies are also given for these defect configurations. These theoretical results can be conveniently used in the analysis of experiments involving heavy-ion-argon collisions. (Author)

AD-786 113/1GA Reprint
Wisconsin Univ Madison Dept of Chemistry
A METHOD FOR CORRECTION OF EFFECTS OF MOLECULAR WEIGHT DISTRIBUTION ON THE DILUTE SOLUTION VISCOELASTICITIES OF HIGH POLYMERS AND ITS APPLICATIONS,
J. D. Ferry. 1974, 6p AROD-9479.15-C
Grant DA-ARO-D-31-124-73-G48
Availability: Pub. in Kobunshi Ronbunshu, v31 n2 p135-137 Feb 74.

Descriptors: *Viscoelasticity, *Polymers, Molecular weight, Solutions(Mixtures), Polystyrene, Organic solvents.

Effects of molecular weight distribution (MWD) on viscoelastics of high polymers in dilute solution are quite large. A simple method was discussed for correction of effects of MWD on reduced intrinsic steady state shear compliance when MWD is narrow. This correction method was successfully applied to viscoelasticities of 4-armed star polystyrenes with MWD in a theta solvent, from which the hydrodynamic interaction parameter of the Zimm-Klib theory was obtained. (Modified author abstract)

AD-786 117/2GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL STUDY OF CHARGING OF PARTICLES 0.2-4 MICROMETERS IN SIZE BY IONS OF AIR,
L. M. Makalskii, and G. Z. Mirzabekyan. 11 Sep 74, 21p Rept no. FTD-HC-23-1647-74
Edited trans. of Silnye Elektricheskie Polya v Tekhnologicheskikh Protesessakh Elektronno-Ionnaya Tekhnologiya. Sbornik Statei (USSR) n2 p95-108 1971.

Descriptors: *Aerosols, *Polarization, Ions, Electrons, Translations, USSR.

AD-786 120/6GA Reprint
New York Univ N Y Dept of Physics
ABSOLUTE MEASUREMENTS OF TOTAL CROSS SECTIONS FOR ELECTRON SCATTERING BY NA2 AND K2 (0.5-50 EV),
Thomas M. Miller, and Abraham Kasdan. 4 Jun 73, 9p AROD-10665.3-P
Grant DA-ARO-D-31-124-73-G20
Sponsored in part by Air Force Office of Scientific Research, Arlington, Va., and National Science Foundation, Washington, D.C.
Availability: Pub. in Jnl. of Chemical Physics, v59 n8 p3913-3919, 15 Oct 73.

Descriptors: *Electron scattering, *Sodium, *Potassium, *Dimers, Diatomic molecules, Cross sections.
Identifiers: Electron molecule interactions.

Absolute measurements have been made of total cross sections for the scattering of electrons by sodium and potassium diatomic molecules, over the electron energy range 0.5-50 eV, at temperatures of 405 and 335C, respectively, using the molecular beam recoil technique. The molecular cross sections lie about 60% and 33% above the respective sodium and potassium atomic cross sections above 2 eV. The measured sodium and potassium molecular total cross sections are reported. (Modified author abstract)

AD-786 138/8GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
CHEMICAL EXCITATION OF 02(SINGLET DELTA G) IN AURORAS.
Scientific interim rept.,
W. Swider. 22 May 74, 6p Rept no. AFCRL-TR-74-0402
Revision of report dated 10 Dec 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n22 p3221-3224, 1 Aug 74.

Descriptors: *Oxygen, *Aurorae, *Excitation, Gas ionization, Molecular energy levels, Electronic states, Ionosphere, Atmospheric chemistry.
Identifiers: Nitrogen oxide(NO), E region.

If about 50% of the O2 is left in the singlet Delta state, the reaction O2(+) + NO to NO(+) + O2 may generate as much O2(singlet Delta) in an aurora as electron impact of O2 by secondary electrons (Cartwright et al., 1972). Together, these processes may yield approximately one O2(singlet Delta) molecule per ion pair formed in the aurora. Stimulated emission of 1.27-micrometer radiation by electron collisions with the normal O2(singlet Delta) nightglow layer is seen as a copious but improbable source of 1.27-micrometer emissions in auroras. The importance of the temporal history and of the temperature for auroral generated O2(singlet Delta) is briefly discussed. (Author)

AD-786 141/2GA Reprint
Air Force Cambridge Research Labs L G Hanscom Field Mass
QUENCHING OF BIACETYL PHOSPHORESCENCE BY INDOLE AND METHIONINE. SOLVENT EFFECTS.
Scientific Interim rept.,
Eiji Fujimori. 26 Jan 73, 5p Rept no. AFCRL-TR-74-0406
Availability: Pub. in Jnl. of Molecular Photochemistry, v6 n1 p91-93 1974.

Descriptors: *Quenching(Inhibition), *Phosphorescence, *Indoles, Organic solvents, Electronic states, Ketones.
Identifiers: *Butane dione/2-3.

While the quenching of biacetyl triplet state by methionine and diethylsulfide is affected by the polarity of solvents, the quenching by indole is not sensitive to different solvents. The formation of ionic intermediates by an electron transfer is favorable in the case of methionine, but not for indole. (Author)

AD-786 153/7GA Reprint
State Univ of New York Stony Brook Dept of Chemistry
EVIDENCE OF A NONZERO CRITICAL EXPONENT N-ETA FOR A MACROMOLECULAR SOLUTION,
S. P. Lee, and B. Chu. 15 Nov 73, 4p AROD-8014.23-C
Grant DA-ARO-D-31-124-73-G30
Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in Jnl. of Chemical Physics, v60 n7 p2940-2941, 1 Apr 74.

Descriptors: *Solutions(Mixtures), *Macromolecules, Temperature.

The probable existence of a small positive eta is demonstrated for a macromolecular solution. (Author)

AD-786 174/3GA PC$3.75/MF$2.25
General Electric Co Santa Barbara Calif Dasiac
REACTION RATE DATA. NUMBER 46.
Apr 74, 26p
Contract DNA001-74-C-0014
See also report dated Feb 74, AD-779 637.

Descriptors: *Scientific research, *Atmospheric chemistry, *Reaction kinetics, Nuclear fireball,

Upper atmosphere, Ions, Photodissociation, Chemiluminescence, Particle collisions, Atoms, Molecules, Energy transfer, Electron transitions.
Identifiers: Metal oxides, Recombination reactions.

The report contains summaries of ongoing research centering around the area of atmospheric reaction kinetics. Transitions, thermochemistry, energy transfer, reactions, and nuclear fireball effects are some topics included.

AD-786 179/2GA Reprint
State Univ of New York Stony Brook Dept of Chemistry
APPLICATION OF LEAST-SQUARES (DIFFERENCE-INTEGRATION) METHOD TO CUMULANTS ANALYSIS IN INTENSITY FLUCTUATION SPECTROSCOPY.
S. P. Lee, and B. Chu. 11 Feb 74, 4p AROD-8014.22-C
Grant DA-ARO-D-31-124-73-G30
Prepared in cooperation with Royal Military Coll., Duntroon (New Zealand). Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in Applied Physics Letters, v24 n11 p575-576, 1 Jun 74.

Descriptors: *Least squares method, *Spectrum analysis, Exponential functions.
Identifiers: Moments method(Statistics), *Intensity fluctuation spectroscopy.

A least-squares difference-integration method is described by which a sum or distribution of exponentials can be characterized using moments or cumulants analysis. Comparison of the higher-order approach with the procedures of Koppel using simulated data at realistic experimental signal-to-noise ratios shows definite improvements in the determination of those moments. (Author)

AD-786 199/0GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
ATTRACTIVE INTERACTIONS BETWEEN CATIONS ADSORBED ON MERCURY. THE UNIQUE BEHAVIOR OF ISOTHIOCYANATO COMPLEXES OF CHROMIUM (III).
Steven N. Frank, and Fred C. Anson. 11 Mar 74, 22p Rept no. Contrib-4808 AROD-3406.32-C
Grant DA-ARO-D-31-124-71-G119
Availability: Pub. in Electroanalytical Chemistry and Interfacial Electrochemistry, v54 p55-74 1974.

Descriptors: *Adsorption, *Metal complexes, *Chromium compounds, *Azides, Ligands, Molecular structure, Concentration(Composition), Electrodes, Mercury, Amines, Cations.
Identifiers: *Mercury electrodes, Electric potential, *Isothiocyanates.

The adsorptions of a number of isothiocyanato and azido-chromium(III) ammine complexes were determined at mercury electrodes as a function of concentration and potential. When the azide or isothiocyanate ligands are in the cis configuration, the complexes are adsorbed very strongly. The cis-isothiocyanato complexes to obey a Frumkin isotherm with an attractive interaction parameter for coverages less than 0.5 despite the fact that the adsorbing molecules are cations. Several possible rationalization for this unique behavior are discussed. The increase in ligand field stabilization energy that accompanies the adsorption of each complex is an important factor contributing to the strength of the adsorption. (Author)

AD-786 201/4GA Reprint
California Inst of Tech Pasadena Arthur Amos Noyes Lab of Chemical Physics
THE LOWEST SINGLET AND TRIPLET EXCITED STATES OF PYRAZINE.
Hwei-Kwan Hong, and G. Wilse Robinson. 4 Sep 73, 22p Rept no. Contrib-4323 AROD-5439.23-C
Contract DA-31-124-ARO(D)-370, Grant NSF-GP-4238
Sponsored in part by grant NSF-GP-7258.
Availability: Pub. in Jnl. of Molecular Spectroscopy, v52 p1-20 1974.

Descriptors: *Visible spectra, *Fluorescence, *Phosphorescence, Emission spectra, Absorption spectra, Nitrogen heterocyclic compounds, Spectrum analysis, Molecular energy levels, Molecular vibration, Electronic states.
Identifiers: *Pyrazines, Matrix isolation techniques.

The phosphorescence, fluorescence and absorption spectra of pyrazine-h4 and -d4 have been obtained at 4K in a benzene matrix. For comparison, those of the isotopically mixed crystal pyrazine-h4 in d4 were also taken. The coincidence of origins of absorption and emission shows that the lowest singlet state is an allowed transition, properly designated as singlet A(1g) to singlet B(3u). The phosphorescence spectrum, when compared with the singlet-triplet excitation spectrum, indicates that the lowest triplet state is also symmetry allowed, showing a strong 0-0 band and the coincidence of origins of absorption and emission. The vibronic structure of the phosphorescence spectrum is very complicated. Under the high resolution attainable in the present experiments, the supposed v6a progression proves to have a composite structure, starting from the second member of the progression. To help resolve the present controversy over the origin of the phosphorescence spectrum observed in crystalline pyrazine, detailed vibrational analyses of the emission spectra were made. The fluorescence spectrum has essentially the same vibronic structure as the phosphorescence spectrum. (Modified author abstract)

AD-786 212/1GA PC$3.25/MF$2.25
Florida Univ Gainesville Dept of Materials Science and Engineering
AN IMPROVED METHOD FOR CALCULATION OF POTENTIAL-PH DIAGRAMS OF METAL-ION-WATER SYSTEMS BY COMPUTER.
M. H. Froning, M. E. Shanley, and E. D. Verink, Jr. 1974, 18p
Contract N00014-68-A-0173-0015

Descriptors: *Chemical equilibrium, *Solutions(Mixtures), *pH factor, *Electrochemistry, Ions, Metals, Computer programming, Phase diagrams, Iron, Sulfides, Sulfates, Chlorides, Water.
Identifiers: Electric potential.

A computer program has been developed for calculating potential-pH diagrams of metal-ion-H2O systems. A brief description of the program is presented along with two diagrams calculated by computer. The method is considerably simpler than previously reported methods and makes use of the concept of 'convexity' from operations research to determine areas of predominance of particular species. (Author)

AD-786 219/6GA PC$3.25/MF$2.25
Utah Univ Salt Lake City Dept of Chemistry
KINETIC STUDIES OF METAL ION COMPLEXATION AND DYE DIMERIZATION BY LASER ULTRASOUND AND LASER T-JUMP.
Technical rept.,
M. M. Farrow, N. Purdie, A. L. Cummings, W. Herrmann, Jr., and Edward M. Eyring. 17 Sep 74, 24p Rept no. TR-4
Contract N00014-67-A-0325-0008

Descriptors: *Metal complexes, *Dimers, *Dyes, Chemical equilibrium, Ultrasonics, Laser beams, Experimental design, Raman spectra, Relaxation, Reaction kinetics, Ions.
Identifiers: *Ultrasonic spectroscopy, *Temperature jump relaxation, Laser Raman spectroscopy, Ultrasonic light diffraction.

There are two comparatively new relaxation techniques for measuring nanosecond time scale reaction rates in liquids: the laser Debye-Sears ultrasonic absorption method and the laser Raman temperature jump technique. Advantages and limitations of these techniques are reviewed, and their use in kinetic studies of metal ion complexation and dye dimerization is surveyed. (Author)

AD-786 244/4GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
EFFECT OF THERMAL ENERGY ON DISSOCIATIVE CHARGE TRANSFER.
Journal article,
C. Lifshitz, and T. O. Tiernan. 16 Apr 73, 6p Rept no. ARL-74-0041
Availability: Pub. in Jnl. of Chemical Physics v59 n11 p6143-6146 1 Dec 73.

Descriptors: *Dissociation, *Alkanes, *Ionization, Mass spectroscopy, Charge transfer, Mercury, Ions, Particle collisions, Temperature.

Dissociations of the molecular ions of neopentane, 2-methylpentane, 2,3-dimethyl butane and n -octane, formed in charge-exchange collisions with Hg(-), were studied using an in-line tandem mass spectrometer. The effect of collision chamber temperature upon the observed dissociations was examined. The results are in good agreement with previous calculations, based on the quasiequilibrium theory (QET) for unimolecular reactions and on the alkane photoionization data. (Author)

AD-786 266/7GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
THE EFFECT OF MODULATION AMPLITUDE ON ELECTRON-EXCITED AUGER DATA FROM TITANIUM.
J. T. Grant, T. W. Haas, and J. E. Houston. 1 Nov 73, 13p Rept no. ARL-74-0056
Availability: Pub. in Surface Science v42 p1-11 1974.

Descriptors: *Titanium, *Auger electron spectroscopy, Amplitude modulation, Power series, Data processing.

The effects of the distortion due to large modulation amplitudes on the electron-excited Auger spectra of titanium have been studied using a cylindrical mirror analyzer. It is found that the normal derivative Auger data are very sensitive, both in magnitude and shape, to the value of the amplitude. The peak-to-peak signal strengths behave in a very complex manner and there is no simple way of relating the various values. Since the background is essentially eliminated in the derivative data, the Auger spectrum, itself, is obtained in the electron energy distribution by integrating the differential spectrum. It is shown that the magnitude and shape of these spectra are better behaved as a function of the modulation amplitude. (Modified author abstract)

AD-786 267/5GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ON THE ENERGIES OF TWO-ELECTRON ATOMS AND IONS.
Journal article,
Edwin J. Callan. 1972, 7p Rept no. ARL-74-0054
Availability: Pub. in the International Jnl. of Quantum Chemistry Symposium No. 7 p111-115 1973.

Descriptors: *Atomic energy levels, *Electrons, Mathematical models, Wave functions.

Inner truncation of the Coulomb interelectron repulsion leads to a simple analytic expression for two electron atom energies which agrees well with results of Pekeris, Drake and Dalgarno, and others for ground, singly, and doubly excited states for a variety of Z values. (Author)

AD-786 277/4GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio

SPECIES COMPOSITION IN THE CO2 DISCHARGE LASER.
Journal article,
Peter D. Tannen, Peter Bletzinger, and A. Garscadden. 24 Aug 73, 9p Rept no. ARL-74-0049
Sponsored in part by Air Force Weapons Lab., Kirtland AFB, N. Mex.
Availability: Pub. in IEEE Jnl. of Quantum Electronics, vQE-10 n1 p6-11 Jan 74.

Descriptors: *Carbon dioxide lasers, *Gas discharges, Carbon dioxide, Chemical composition, Nitrogen oxides, Mass spectra, Oxygen, Ions, Gas analysis, Helium, Nitrogen.

The composition of a sealed discharge in He-N2-CO2 and He-CO2 mixtures was studied with a quadrupole mass spectrometer. A modulated molecular beam sampling technique allowed direct measurement of the molecular, atomic, and ionic species produced in the discharge. Effective formation and destruction rates were measured for various species. In particular, the nitrogen oxides, NO and NO2, are formed in sufficient quantities to affect the performance of CO2 lasers. In the He-N2-CO2 mixture the dominant ion changes from CO2(+) to NO(+), while in He-CO2, O2(+) becomes the major ion. (Author)

AEC-tr-7566 PC$4.00/MF$2.25
USAEC Technical Information Center, Oak Ridge, Tenn.
RADIOCHEMICAL METHOD OF DETERMINATION OF URANIUM, NEPTUNIUM, PLUTONIUM, TRANSPLUTONIUM, AND RARE-EARTH ELEMENTS IN SAMPLES OF AEROSOLS, RADIOACTIVE FALLOUT, AND SOIL.
L. I. Gedeonov, Z. G. Gritchenko, T. P. Makarova, A. M. Maksimova, and A. V. Stepanov. 1973, 14p
Translation of Radiokhimicheskaya metodika opredeleniya urana, neptuniya, plutoniya, transplutonievykh i redkozemel'ynkh elementov v probakh aerozoley, radioaktivnykh vypadeniyakh i pochvakh.

Descriptors: (*Radioactive aerosols, *Radiochemical analysis), (*Fallout, Radiochemical analysis), (*Soils, Radiochemical analysis), (*Uranium, Radiochemical analysis), Alpha spectroscopy, Americium, Americium 241, Aqueous solutions, Benzene, Beta spectroscopy, Cerium, Chemical analysis, Curium, Curium 242, Edta, Electrophoresis, Ethyl ether, Europium, Gamma spectroscopy, Ion exchange, Ion exchange chromatography, Isotope ratio, Lanthanum, Neodymium, Neptunium, Neptunium 237, Neptunium 239, Organic ion exchangers, Plutonium, Plutonium 239, Plutonium 240, Praseodymium, Promethium, Promethium 147, Quantitative chemical analysis, Solvent extraction, Tta, Yttrium, Yttrium 90.

For abstract, see NSA 30 08, number 20639.

AECL-4828 PC$8.50/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
CHEMISTRY AND MATERIALS DIVISION PROGRESS REPORT, JANUARY 1 TO MARCH 31, 1974.
May 74, 106p PR-CMa-28
U.S. Sales Only.

Descriptors: (*Chemistry, *Research programs), Management, Nuclear chemistry, Radiation chemistry.

For abstract, see NSA 30 08, number 23280.

AERE-R-7345 PC$6.50/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
CHEK AND CHEKMAT: TWO CHEMICAL REACTION KINETICS PROGRAMS.
A. R. Curtis, and E. M. Chance. May 74, 68p
U.S. Sales Only.

Descriptors: (*Computer codes, *C codes), (*Chemical reaction kinetics, *Computer calculations), Data acquisition, Economics, Ibm computers, Simulation, Solutions, Stirring.

For abstract, see NSA 30 08, number 23346.

AREAEE-183 PC$4.00/MF$2.25
Atomic Energy Establishment, Cairo (Egypt).
PRELIMINARY STUDIES OF GRAIN GROWTH IN CAF SUB 2 .
N. A. Haroun, and G. I. Orabi. 1973, 14p
U.S. Sales Only.

Descriptors: (*Calcium fluorides, *Grain growth), Chromium oxides, Doped materials, Magnesium oxides, Manganese oxides, Nickel oxides, Size, Zinc oxides.

For abstract, see NSA 30 08, number 23396.

BARC-696 PC$4.25/MF$2.25
Bhabha Atomic Research Centre, Bombay (India). Metallurgy Div.
ELECTRON PROBE MICROANALYSIS: DISCUSSION OF VARIOUS CORRECTION FACTORS.
S. K. Khera. 1973, 26p
U.S. Sales Only.

Descriptors: (*Electron microprobe analysis, *Corrections), Absorption, Accuracy, Atomic number, Correlations, Films, Fluorescence, Minerals.

For abstract, see NSA 30 08, number 23347.

BARC-700 PC$4.00/MF$2.25
Bhabha Atomic Research Centre, Bombay (India). Spectroscopy Div.
NORMAL COORDINATE ANALYSIS OF METHYL AMINE AND ITS DEUTERATED SPECIES.
G. S. Ghodgaonkar. 1973, 10p
U.S. Sales Only.

Descriptors: (*Deuterium, *Isotope effects), Amines, Deuterium compounds, Structural chemical analysis, Valence.

For abstract, see NSA 30 08, number 20683.

BNWL-CC-1381 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
RATE CONSTANTS FOR THE REACTION OF CARBON DIOXIDE AND WATER VAPOR WITH KC GRAPHITE.
R. C. Giberson. 13p
Contract AT(45-1)-1830

Descriptors: (*Carbon dioxide, *Chemical reaction kinetics), (*Water vapor, Chemical reaction kinetics), (*Graphite, *Oxidation), Carbon monoxide, Hydrogen, Temperature dependence.

For abstract, see NSA 30 08, number 20684.

CEA-R-4562 PC$6.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France).
JUMP CONDITIONS AND ENTROPY SOURCES IN TWO-PHASE SYSTEMS.
J. M. Delhaye. Jul 74, 59p
In French. U.S. Sales Only.

Descriptors: (*Two-phase flow, *Kinetic equations), Angular momentum, Boundary conditions, Entropy, Equations, Interfaces, Kinetic energy, Linear momentum, Mass transfer, Surface properties, Surface tension, Thermodynamics.

For abstract, see NSA 30 08, number 23439.

COM-74-50833/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SPECTROSCOPIC STUDIES OF THE SO2 DISCHARGE SYSTEM. I. THE MICROWAVE SPECTRUM AND STRUCTURE OF S2O.
Final rept.,
E. Tiemann, J. Hoeft, F. J. Lovas, and D. R. Johnson. 15 Jun 74, 5p
Pub. in Jnl. of Chemical Physics, v60 n12 p5000-5004, 15 Jun 74.

Descriptors: *Microwave spectra, Ground state, Molecular structure, Molecular rotation, Molecular energy levels.
Identifiers: *Sulfur oxide(S2O), Vibrational energy levels.

The microwave spectrum of S2O has been reexamined in order to obtain reliable predictions of all rotational transitions up to J = 50 in the frequency region 10-130 GHz and to determine the structure of the molecule. A centrifugal distortion analysis has been carried out on the ground state and lowest bending vibrational state of 32S32S16O. Centrifugal distortion corrected rotational constants have also been obtained for 34S32S16O and 32S34S16O. These observations allowed determination of the structure.

COM-74-50834/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SPECTROSCOPIC STUDIES OF THE SO2 DISCHARGE SYSTEM. II. MICROWAVE SPECTRUM OF THE SO DIMER.
Final rept.,
F. J. Lovas, E. Tiemann, and D. R. Johnson. 15 Jun 74, 6p
Pub. in Jnl. of Chemical Physics, v60 n12 p5005-5010, 15 Jun 74.

Descriptors: *Microwave spectra, Excitation, Ground state, Molecular structure, Dimers, Spectrum analysis, Gas discharges, Sulfur dioxide, Dipole moments.
Identifiers: *Sulfur monoxide, Vibrational energy levels.

Microwave spectra assignable to a dimer of SO have been detected in an electric discharge of SO2. A centrifugal distortion analysis has been carried out on the spectra from the ground state and the lowest excited vibrational state and the ground vibrational state of 16O32S32S16O. The molecule was found to have a planar cis configuration. Molecular geometry is reported. The observed dipole moment of OSSO is 3.17(10) Debye.

COM-74-50851/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CHEMISORPTION OF H2 ON W(100): ABSOLUTE STICKING PROBABILITY, COVERAGE, AND ELECTRON STIMULATED DESORPTION.
Final rept.,
Theodore E. Madey. 1973, 14p
Pub. in Surface Science, v36 p281-294 1973.

Descriptors: *Chemisorption, *Tungsten, *Hydrogen, Deuterium, Adsorption, Surfaces, Desorption, Electron irradiation, Isotope effect.

Measurements of the absolute sticking probability and coverage of H2 adsorbed on W(100) at 300 K have been made using a precision gas dosing system; a known fraction of the molecules entering the vacuum chamber struck the sample crystal before reaching a mass spectrometer detector. Electron stimulated desorption (ESD) studies reveal that the low coverage Beta 2 hydrogen state on W(100) yields H(+) ions upon bombardment by 100 eV electrons; the ion desorption cross section is reported. An isotope effect in electron stimulated desorption of H(+) and D(+) has been found.

COM-74-50855/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.

ADSORPTION OF OXYGEN ON W(100): ADSORPTION KINETICS AND ELECTRON STIMULATED DESORPTION.
Final rept.,
Theodore E. Madey. 1972, 22p
Pub. in Surface Science, v33 p355-376 1972.

Descriptors: *Adsorption, *Desorption, *Oxygen, *Tungsten, Reaction kinetics, Chemisorption, Experimental design, Single crystals, Surfaces, Electron irradiation.

The interaction of O2 with a single crystal W(100) at 300 K has been examined using a combination of techniques. A precision gas dosing system was used to deposit O2 onto the crystal. The Electron Stimulated Desorption (ESD) measurements of absolute O(+) ion yields and energy distributions as a function of oxygen exposure were made during bombardment by 100 eV electrons. A measurable ion yield is detectable at the earliest stages of adsorption. Evidence of reconstruction of the substrate at this coverage follows from this and other work. An estimate of the angular distribution of ESD-liberated o(+) ions was made using a primitive two-segment collector. The ion angular distribution is strongly peaked in the direction normal to the surface. Implications of this observation for the possible identification of chemisorption sites are discussed. Work function changes and elastic electron reflection characteristics have been measured for the oxygen-covered and clean W(100) surface.

COM-74-50858/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ABSOLUTE CROSS SECTIONS FOR ELECTRON-IMPACT EXCITATION OF N2(+).
Final rept.,
D. H. Crandall, W. E. Kauppila, R. A. Phaneuf, P. O. Taylor, and G. H. Dunn. Jun 74, 7p
Contract AT(49-2)-1165
Pub. in Physical Review A, v9 n6 p2545-2551 Jun 74.

Descriptors: *Nitrogen, *Excitation, Emission, Cross sections, Electron energy, Electron beams, Ion beams, Molecular energy levels.
Identifiers: Electron ion interactions.

Crossed beams of N2(+) and electrons were used to measure the absolute cross sections for the excitation X doublet Sigma(+)g to B doublet Sigma(+)u over an electron energy range from below threshold (3.17 eV) to 91 eV. Absolute emissions of the 391.4 nm band were measured from impact of electrons on N2(+) ions in various state mixtures. Corrections were made to the data to account for state mixtures and other effects to obtain the cross section for the above process.

COM-74-50866/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
HIGH PRESSURE DIELECTRIC MEASUREMENTS AND THE THEORIES FOR THE DIELECTRIC CONSTANT OF A LIQUID.
Final rept.,
F. I. Mopsik. 1970, 5p
Pub. in Proceddings of Conference on Electrical Insulation and Dielectric Phenomena, Buck Hill Falls, Pa., 20-22 Oct 69 p64-68 (National Academy of Sciences, Washington, D.C.) 1970.

Descriptors: *Dielectric properties, *Liquids, Density(Mass/volume), Pressure, Temperature.

The conventional approach to the examination of the validity of the theories for the dielectric constant of the liquid state is to use dielectric measurements over a range of temperature and perhaps, also refractive index measurements. However, density is one of the most important variables in these theories and the molecular parameters involved could be mildly density dependent. Therefore a more valid approach is to combine high pressure dilatometry with dielectric measurements so that temperature and density dependencies of the dielectric constant can be separated. Results of measurements to 2 kbar over a moderate range of temperature for several liquids will be presented and examined in order to establish the validity of dielectric theory.

COM-74-50869/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
POSITION OF THE SP6 CONFIGURATION IN THE NEUTRAL HALOGENS.
Final rept.,
Joseph Reader. Jul 74, 2p
Pub. in Jnl. of the Optical Society of America, Letters to the Editor, v64 n7 p1017-1018 Jul 74.

Descriptors: *Halogens, Atomic energy levels, Bromine.
Identifiers: *Electronic states.

An extrapolation of the unperturbed position of the 4s4p6 doublet S(1/2) level in the Br I isoelectronic sequence shows that this level will most likely lie above the ionization limit in neutral Br. It is concluded that the sp6 configuration cannot be identified in the neutral halogen atoms by isoelectronic extrapolation of observed level positions, thus calling into question the identification of this configuration in neutral chlorine, bromine, and iodine.

COM-74-50872/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INFRARED SPECTRUM OF CS2: 'HOT' BANDS ASSOCIATED WITH THE 2185/CM BAND AND EVIDENCE FOR THE CS2 LASER ASSIGNMENT.
Final rept.,
Arthur G. Maki, and Robert L. Sams. 1974, 11p
Pub. in Jnl. of Molecular Spectroscopy, v52 p233-243 1974.

Descriptors: *Carbon disulfide, *Infrared spectra, Spectrum analysis.

The 10(0)1-00(0)0 band of CS2 has been measured with a resolution of 0.030/cm. 'Hot' bands associated with this transition were also measured and analyzed. The 10(0)1-00(0)0 bands of the isotopic species 13C32S2, 12C32S33S, and 12C32S34S were measured in natural abundance. With the results of these measurements it is shown that the 02(0)1-12(0)0 transitions do indeed coincide with the CS2 laser transitions as do the 00(0)1-10(0)0 transitions. New arguments are given favoring the latter assignment.

COM-74-50873/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTERACTION OF OXYGEN WITH POLYCRYSTALLINE TUNGSTEN. I. STICKING PROBABILITIES AND DESORPTION SPECTRA.
Final rept.,
D. A. King, T. E. Madey, and J. T. Yates, Jr. 1 Oct 71, 11p
Pub. in Jnl. of Chemical Physics, v55 n7 p3236-3246 Oct 71.

Descriptors: *Adsorption, *Chemisorption, *Desorption, *Oxygen, Tungsten oxides, Polycrystalline, Tungsten, Temperature.
Identifiers: Oxygen atoms.

The interaction of oxygen with a polycrystalline W filament has been studied in the temperature range 300-1200K. Both sticking probabilities and desorption spectra have been measured. After low exposures the adsorbate is all desorbed as O atoms with first order kinetics. With higher exposures, oxygen is removed as oxides: WO, WO2, WO3, W2O6. The desorption spectra for each of these species are complex, and nine distinct and reproducible oxide states are identified. Saturation coverages in each of these states are independent of adsorption temperature. The kinetics of adsorption and desorption are evaluated and discussed.

COM-74-50875/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
HIGH-PRESSURE PHOTOIONIZATION MASS SPECTROMETRY. EFFECT OF INTERNAL ENERGY AND DENSITY ON THE ION-MOLECULE REACTIONS OCCURRING IN METHYL, DIMETHYL, AND TRIMETHYLAMINE.
Final rept.,
L. Hellner, and L. W. Sieck. 1973, 10p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in International Jnl. of Chemical Kinetics, v5 p177-186 1973.

Descriptors: *Methylamine, Ionization, Rates(Per time), Charge transfer, Far ultraviolet radiation, Reaction kinetics.
Identifiers: Ion molecule interactions, *Trimethylamine, *Dimethylamine, Photoionization mass spectroscopy.

The ion-molecule reactions of CH3NH2(+), (CH3)2NH(+), and (CH3)3N(+) with the respective amines have been investigated at thermal kinetic energies in a high pressure photoionization mass spectrometer at several wavelengths (energies) in the vacuum are reported. The reactions of several fragment ions are also reported. Experiments were also carried out at pressures up to 0.5 torr in order to investigate the further solvation of CH3NH2(+), (CH3)2NH2(+), and (CH3)3NH(+).

COM-74-50884/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ISOTOPE DEPENDENCE OF THE ROTATIONAL CONSTANT OF SULFUR MONOXIDE IN THE TRIPLET SIGMA-GROUND STATE.
Final rept.,
Eberhard Tiemann. 1974, 5p
Pub. in Jnl. of Molecular Spectroscopy, v51 p316-320 1974.

Descriptors: *Microwave spectra, Molecular rotation, Spectrum analysis.
Identifiers: *Sulfur monoxide, Rotational spectra.

The rotational spectra of 32S16O, 34S16O and 32S18O were measured. The rotational constant was accurately determined for all three isotopes whereas the spin-spin coupling and the spin-rotation coupling have less accuracy due to the strong correlation of these constants for the observed transitions. The evaluated breakdown of the Born-Oppenheimer approximation can primarily be attributed to the nonadiabatic correction term found for singlet Sigma-diatomic molecules. The small adiabatic correction for SO is obtained with the opposite sign as usually derived in singlet Sigma-molecules.

COM-74-50885/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE BAO-PT SYSTEM IN AIR.
Final rept.,
S. J. Schneider, and C. L. McDaniel. 21 Sep 69, 2p
Pub. in Jnl. of the American Ceramic Society, Discussions and Notes, v52 n9 p518-519, 21 Sep 69.

Descriptors: *Barium oxides, *Platinum, Dissociation, Temperature, X ray diffraction, Platinum oxides, Phase diagrams, Differential thermal analysis, Solid solutions.
Identifiers: *Phase studies.

The phase relations between BaO and Pt in air were studied by x-ray diffraction, differential thermal analysis, and quenching techniques. At lower temperatures the system can be represented by the BaO-PtO2 pseudobinary. Prominent features of the system include a hexagonal 4BaO-PtO2 compound, a phase of unknown composition and symmetry and a solid solution (orthorhombic existing approximately between 33 and 50 mole % PtO2 at 1025C. At higher temperatures all intermediate phases eventually dissociate to BaO and Pt. The

dissociation temperature of PtO2 in air was determined as 585C.

FRNC-TH-494 PC$10.50/MF$2.25
Pau Univ., 33 (France).
SUPERCOOLING OF HEAVY WATER.
M. Lere-Porte. 1970, 147p
In French. U.S. Sales Only.

Descriptors: (*Heavy water, *Supercooling), Binary mixtures, Freezing, Melting points, Water, Potassium chlorides.

For abstract, see NSA 30 08, number 20685.

IEA-304 PC$5.75/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
RADIOTRACER DETERMINATION OF THE WEIGHT OF MERCURY IMMOBILIZED IN ELECTROLYTIC CELLS.
C. Szulak, M. Said, T. Ohara, A. Castagnet, and W. Sanchez. Aug 73, 52p
In Portuguese. U.S. Sales Only.

Descriptors: (*Mercury, *Radiometric analysis), Accuracy, Electrolytic cells, Isotope dilution, Mercury 203, Quantitative chemical analysis, Tracer techniques, Weight.

For abstract, see NSA 30 08, number 20642.

IPP-III-13 PC$4.25/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
JOINT STATISTICAL COUNT OF FREE AND BOUND ELECTRON STATES.
O. Klueber, and H. Wulff. Jun 74, 21p
In German. U.S. Sales Only.

Descriptors: (*Atoms, *Energy levels), (*Hydrogen, Energy levels), Boltzmann statistics, Bound state, Distribution functions, Eigenfunctions, Electron-atom collisions, Electronic structure, Electrons, Entropy, Equilibrium, Neutral particles, Saha equation, Statistics.

For abstract, see NSA 30 08, number 22207.

IS-M-20 PC$4.00/MF$2.25
Ames Lab., Iowa.
SURVEY OF SOME PROPERTIES OF AQUEOUS RARE EARTH SALT SOLUTIONS. I. VOLUME, THERMAL EXPANSION, RAMAN SPECTRA, AND X-RAY DIFFRACTION.
A. Habenschuss, and F. H. Spedding. 1974, 10p CONF-741002-5

Descriptors: (*Lutetium perchlorates, *Density), (*Lutetium nitrates, Density), (*Lutetium chlorides, Density), (*Lanthanum perchlorates, Density), Aqueous solutions, Chlorides, Dysprosium perchlorates, Erbium chlorides, Gadolinium perchlorates, Lanthanum chlorides, Lanthanum nitrates, Molecular weight, Neodymium chlorides, Neodymium nitrates, Neodymium perchlorates, Nitrates, Perchlorates, Physical properties, Praseodymium chlorides, Quantity ratio, Raman effect, Rare earth compounds, Temperature dependence, Terbium chlorides, Thermal expansion, Volume, X-ray diffraction.

For abstract, see NSA 30 08, number 20686.

IS-M-21 PC$4.00/MF$2.25
Ames Lab., Iowa.
SURVEY OF SOME PROPERTIES OF AQUEOUS RARE EARTH SALT SOLUTIONS. II. HEATS OF DILUTION, HEAT CAPACITIES, ACTIVITY COEFFICIENTS, ELECTRICAL CONDUCTANCES, AND RELATIVE VISCOSITIES.
J. A. Rard, and F. H. Spedding. 1974, 10p CONF-741002-8

Descriptors: (*Rare earth compounds, *Thermodynamic properties), Aqueous solutions, Chlorides, Electric conductivity, Enthalpy, Gadolinium chlorides, Gadolinium nitrates, Gadolinium perchlorates, Lutetium chlorides, Lutetium nitrates, Lutetium perchlorates, Nitrates, Perchlorates, Reaction kinetics, Specific heat, Terbium chlorides, Terbium nitrates, Terbium perchlorates, Viscosity.

For abstract, see NSA 30 08, number 20687.

IS-T-630 PC$15.75/MF$2.25
Ames Lab., Iowa.
RELATIVE APPARENT MOLAL HEAT CONTENTS AND RELATED THERMODYNAMIC PROPERTIES OF SOME RARE EARTH NITRATES AND PERCHLORATES AT 25 EXP 0 C.
J. L. Derer. Jul 74, 255p
Contract W-7405-eng-82

Descriptors: (*Samarium nitrates, *Thermodynamic properties), (*Samarium perchlorates, Thermodynamic properties), (*Perchlorates, Thermodynamic properties), (*Praseodymium perchlorates, Thermodynamic properties), Aqueous solutions, Dysprosium nitrates, Dysprosium perchlorates, Formation heat, Least square fit, Nitrates, Praseodymium nitrates, Rare earth compounds, Solution heat, Terbium nitrates, Thulium nitrates, Ytterbium nitrates.

For abstract, see NSA 30 08, number 23408.

IS-T-646 PC$11.25/MF$2.25
Ames Lab., Iowa.
THERMAL DIFFUSION IN POLYATOMIC GASES.
M. K. Matzen. May 74, 165p

Descriptors: (*Gases, *Thermal diffusion), (*Carbon monoxide, Thermal diffusion), (*Carbon oxides, Thermal diffusion), Atom collisions, Atoms, Binary mixtures, Electric fields, Isotopes, Magnetic fields, Mass, Mathematical models, Mixtures, Molecule collisions, Self-diffusion, Thermal conductivity.

For abstract, see NSA 30 08, number 23360.

ITF-74-29P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SOLITARY EXCITONS IN THE RECTILINEAR MOLECULAR CHAIN.
N. I. Kislukha. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Molecules, *Excited states), Deformation, Excitation, Excitons, Numerical solution, Particle interactions.

For abstract, see NSA 30 08, number 23456.

ITF-74-45P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
THEORY OF INFRARED ABSORPTION WITH SPIN WAVE EXCITATION IN ALPHA -OXYGEN.
Yu. B. Gaididei, and V. M. Loktev. 1974, 29p
In Russian. U.S. Sales Only.

Descriptors: (*Oxygen, *Absorption spectra), Antiferromagnetism, Infrared radiation, Magnetic fields, Polarization, Solids, Spectra, Spin waves, Very low temperature.

For abstract, see NSA 30 08, number 23457.

ITP-74-3E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
IRREDUCIBLE REPRESENTATIONS OF THE SYMMETRY GROUP IN MANY ELECTRON PROBLEMS.
M. F. Olekseeva, and K. D. Tovstyuk. 1974, 13p
U.S. Sales Only.

Descriptors: (*Electrons, *Interactions), Correlations, Crystals, Green function, Space-time, Symmetry groups.

For abstract, see NSA 30 08, number 23459.

JuL-Bibl.-18 PC$5.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorbauelemente.
GAS CHROMATOGRAPHIC TRACE ANALYSIS IN HE FROM GAS-COOLED REACTORS. A LITERATURE COMPILATION.
Y. Cany, and J. Hickert. Feb 74, 40p
In several languages. U.S. Sales Only.

Descriptors: (*Helium, *Chemical analysis), Bibliographies, Gas chromatography, Gas cooled reactors, Trace amounts.

For abstract, see NSA 30 08, number 20614.

JINR-P12-7927 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
ABOUT POSSIBLE INFLUENCE OF QUANTUM-MECHANICAL BEATS ON THE CHEMICAL REACTION RATE.
V. A. Onishchuk, and M. I. Podgoretskii. 1974, 17p
In Russian. U.S. Sales Only.

Descriptors: Chemical reaction kinetics, Equations, Isomers, Molecules, Quantum mechanics, Stereochemistry.

For abstract, see NSA 30 08, number 23361.

JUL-1046-CT PC$4.75/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Chemische Technologie.
NONDESTRUCTIVE CONTROL OF FISSILE MATERIAL CONTAINING RADIOACTIVE FISSION PRODUCTS WITH A SB--BE NEUTRON SOURCE BY SELECTIVE TRANSPORT OF FISSION NEUTRONS IN HYDROGENOUS MATERIAL.
P. Filss. Feb 74, 33p
U.S. Sales Only.

Descriptors: (*Fissile materials, *Nuclear reaction analysis), (*Spent fuel elements, Nuclear reaction analysis), (*Fuel elements, Nuclear reaction analysis), (*Radioactive wastes, Nuclear reaction analysis), Chemical analysis, Fission neutrons, Fission products, Neutron transport, Neutrons, Nuclear materials management, Uranium 235.

For abstract, see NSA 30 08, number 20583.

KFKI-74-16 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
EFFECT OF THE SPATIAL- AND TIME-FLUCTUATIONS OF THE IRRADIATING FLUX ON THE ACCURACY OF THE ACTIVATION ANALYSIS.
Sz. Vass, B. Vorsatz, and B. Keszei. May 74, 18p
U.S. Sales Only.

Descriptors: (*Activation analysis, *Accuracy), Errors, Particle beams, Spatial distribution, Time dependence.

For abstract, see NSA 30 08, number 20584.

LA-UR-74-931 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.

TRANSIENT DYNAMICS OF CHEMICALLY REACTIVE GASEOUS MIXTURES WITH TURBULENCE.
W. C. Rivard, T. D. Butler, and O. A. Farmer.
1974, 8p CONF-740625-3
Contract W-7405-eng-36

Descriptors: (*Gases, *Chemical reaction kinetics), (*Computer codes, *R codes), Boundary conditions, Compressible flow, Configuration, Density, Detonations, Jets, Kinetic energy, Mixing, Mixtures, Numerical solution, Transients, Turbulence.

For abstract, see NSA 30 08, number 23365.

LA-5568 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
IMPROVED TWO-COLUMN ION EXCHANGE SEPARATION OF PLUTONIUM, URANIUM, AND NEODYMIUM IN MIXED URANIUM–PLUTONIUM FUELS FOR BURNUP MEASUREMENT.
S. F. Marsh, M. R. Ortiz, R. M. Abernathey, and J. E. Rein. Jun 74, 7p
Contract W-7405-eng-36

Descriptors: (*Plutonium, *Ion exchange chromatography), (*Uranium, Ion exchange chromatography), (*Neodymium, Ion exchange chromatography), (*Spent fuels, *Burnup), Americium, Fission products, Hydrochloric acid, Hydrofluoric acid, Ion exchange, Ion exchange materials, Isotope dilution, Mass spectroscopy, Perchloric acid, Separation processes.

For abstract, see NSA 30 08, number 20661.

LA-5653-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
FREE ENERGY IN CONCENTRATION SPACE.
C. J. Everett. Jul 74, 8p
Contract W-7405-eng-36

Descriptors: (*Gases, *Free energy), Chemical reaction kinetics, Thermodynamics.

For abstract, see NSA 30 08, number 23364.

LBL-2693 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
CATALYTIC OXIDATION OF SO2 ON CARBON PARTICLES.
T. Novakov, and S. G. Chang. Apr 74, 19p CONF-740311-4
Contract W-7405-eng-48

Descriptors: (*Sulfur dioxide, *Oxidation), Activated carbon, Adsorption, Aerosols, Air pollution, Binding energy, California, Carbon, Catalysis, Catalysts, Charcoal, Chemical reactions, Daily variations, Filters, Graphite, Health hazards, Lead, Nitrogen, Particles, Propane, Sulfur, Visible radiation.

For abstract, see NSA 30 08, number 23368.

LFEN-155(a) PC$6.75/MF$2.25
Junta de Energia Nuclear, Sacavem (Portugal). Lab. de Fisica e Engenharia Nucleares.
CONTRIBUTION TO THE STUDY OF ELECTRON PARAMAGNETIC RESONANCE OF SOME ORGANIC RADICAL ANIONS.
H. M. Novais. 1973, 75p
In Portuguese. U.S. Sales Only.

Descriptors: (*Anions, *Electron spin resonance), Ion exchange materials, Organic compounds, Radicals.

For abstract, see NSA 30 08, number 23369.

N-1536pm PC$4.50/MF$2.25
Chicago Univ., Ill.
QUANTITATIVE DETERMINATION OF PLUTONIUM IN BIOLOGICAL MATERIALS. PART I. THE ANALYSIS OF URINE.
E. R. Russell, J. Schubert, and J. A. Jackson. 11 Jun 46, 27p

Descriptors: (*Urine, *Radiochemical analysis), (*Plutonium, Radiochemical analysis), Adsorption, Ion exchange, Quantitative chemical analysis, Sample preparation, Solvent extraction.

For abstract, see NSA 30 08, number 20643.

NRPB-R-17 PC$4.00/MF$2.25
National Radiological Protection Board, Harwell (UK).
DETERMINATION OF PLUTONIUM IN URINE BY ULTRAFILTRATION.
G. N. Strading, D. S. Popplewell, and G. J. Ham. Dec 73, 16p
U.S. Sales Only.

Descriptors: (*Plutonium, *Radiometric analysis), (*Urine, *Chemical analysis), Bioassay, Filters, Membranes, Polymers, Quantitative chemical analysis, Scintillation counting, Ultrafiltration.

For abstract, see NSA 30 08, number 20644.

N74-29474/5GA PC$7.75/MF$2.25
Technische Universitaet, Hanover (West Germany).
STUDY OF THE REACTION BETWEEN METHANE AND FLUORINE IN SUPERSONIC FREE JETS UNTERSUCHUNG DER REAKTION ZWISCHEN METHAN UND FLUOR IN UEBERSCHALLFREISTRAHLEN.
Ph.D. Thesis.
H. J. Diesner. 1973, 92p
Language in German.

Descriptors: *Exothermic reactions, *Fluorination, *Methane, Flames, Gas dynamics, Supersonic combustion, Supersonic jet flow.

For abstract, see STAR 1219

N74-29478/6GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN IMPLICIT SEMIANALYTIC NUMERICAL METHOD FOR THE SOLUTION OF NONEQUILIBRIUM CHEMISTRY PROBLEMS.
R. A. Graves, Jr., P. A. Gnoffo, and R. E. Boughner. Jul 74, 19p NASA-TM-X-71985

Descriptors: *Analytic functions, *Chemistry, *Problem solving, Differential equations, Quadratures.

For abstract, see STAR 1219

N74-29598/1GA PC$9.50/MF$2.25
Bochum Univ. (West Germany).
NUCLEAR RESONANCE ELECTRONICS FOR HIGH FREQUENCY MEASUREMENTS. TECHNICAL IMPULSE AND VARIABLE FREQUENCY MEASUREMENTS ON NARROW AND WIDE RESONANCE LINES KERNRESONANZ-ELEKTRONIK FUER HOHE MESSFREQUENZEN IMPULSTECHNISCHE UND FREQUENZVARIABLE MESSUNG SCHMALER UND BREITER RESONANZLINIEN.
Ph.D. Thesis.
H. Berger. 1972, 126p
Language in German.

Descriptors: *Line spectra, *Nuclear magnetic resonance, *Spectrometers, Equipment specifications, High frequencies, Phase coherence, Spin-lattice relaxation.

For abstract, see STAR 1219

N74-29973/6GA PC$9.00/MF$2.25
Technische Hochschule, Hanover (West Germany).
STUDY ON THE CATALYTIC ACTIVITY OF THIN NICKEL LAYERS UP TO THE REGION OF ATOMIC DISPERSION UNTERSUCHUNG DER KATALYTISCHEN AKTIVITAET DUENNER NICKEL-SCHICHTEN BIS IN DEN BEREICH ATOMARER DISPERSION.
Ph.D Thesis.
V. Haertel. 21 Feb 73, 117p
Language in German.

Descriptors: *Catalytic activity, *Nickel, *Thin films, Atom concentration, Film thickness, Hydrogen, Methane, Monte carlo method, Semiconducting films.

For abstract, see STAR 1219

N74-30003/9GA PC$7.50/MF$2.25
Boeing Aerospace Co., Huntsville, Ala. Nuclear and Space Physics Group.
FURTHER ANALYSIS OF FIELD EFFECTS ON LIQUIDS AND SOLIDIFICATION.
Final Report.
R. F. Seiler, R. I. Miller, and W. S. Chen. 9 Jul 74, 88p NASA-CR-120313, D256-10024
Contract NAS8-28664

Descriptors: *Liquids, *Magnetic fields, *Solidification, Metals, Semiconductors (Materials), Thermal conductivity.

For abstract, see STAR 1219

N74-30503/8GA PC$7.25/MF$2.25
Technische Universitaet, Munich (West Germany).
CHEMISORPTION OF CARBON MONOXIDE AND CARBON DIOXIDE ON GRAPHITE CHEMISORPTION VON CO UND CO2 AN GRAPHIT.
Ph.D. Thesis.
P. Haslbeck. 20 Jul 73, 84p
Language in German.

Descriptors: *Carbon dioxide, *Carbon monoxide, *Chemisorption, *Graphite, Catalysis, Kinematics, Pressure effects, Reaction kinetics, Temperature effects.

For abstract, see STAR 1220

N74-30504/6GA PC$8.75/MF$2.25
Technische Universitaet, Munich (West Germany).
ELECTROCHEMICAL STUDIES ON THE OXYGEN REDUCTION BY HIGHLY POROUS ELECTRODES ELEKTROCHEMISCHE UNTERSUCHUNGEN ZUR SAUERSTOFFREDUKTION AN HOCHPOROESEN ELEKTRODEN.
Ph.D. Thesis.
J. Lendvay. 23 Jul 73, 115p
Language in German.

Descriptors: *Deoxygenation, *Electrodes, *Porous materials, *Silver compounds, *Teflon (Trademark), Catalysis, Electrochemical cells, Mercury (Metal), Nickel, Reaction kinetics, Voltampere characteristics.

For abstract, see STAR 1220

N74-30505/3GA PC$12.75/MF$2.25
Technische Universitaet, Munich (West Germany).
REVERSIBLE ELECTRODE REACTIONS OF DIFFICULT TO DISSOLVE MATERIALS IN NONAQUATIC ELECTROLYTES (A CONTRIBUTION TO THE KNOWLEDGE ON POTENTIAL CATHODES FOR SECONDARY HIGH ENERGY DENSITY BATTERIES WITH SPECIAL CONSIDERATION OF GRAPHITE COMPOUNDS) REVERSIBLE ELEKTRODENREAKTIONEN SCHWERLOESLICHER

STOFFE IN NICHTWAESSRIGEN ELEKTROLYTEN (EIN BEITRAG ZUR KENNTNIS POTENTIELLER KATHODEN FUER SEKUNDAERBATTERIEN HOHER ENERGIEDICHTE UNTER BESONDER BERUECKSICHTIGUNG VON VERBINDUNGEN DES GRAPHITS).
Ph.D. Thesis.
J. O. Besenhard. 17 May 73, 193p
Language in German.

Descriptors: *Electrochemistry, *Electrodes, *Graphite, *Reduction (Chemistry), Cell cathodes, Copper, Mercury (Metal), Organic lithium compounds, Silver, Titanium.

For abstract, see STAR 1220

N74-30506/1GA PC$10.50/MF$2.25
Technische Universitaet, Munich (West Germany).
STUDIES ON THE PHOTOELECTROCHEMICAL BEHAVIOR OF METAL ELECTRODES UNTERSUCHUNGEN ZUM PHOTOELEKTROCHEMISCHEN VERHALTEN VON METALLELEKTRODEN.
Ph.D. Thesis.
E. Meyer. 2 Aug 73, 147p
Language in German.

Descriptors: *Electrodes, *Free electrons, *Metals, *Photoelectric emission, Electrochemistry, Electron states, Excitation, Photocathodes, Potential energy.

For abstract, see STAR 1220

N74-30508/7GA PC$4.25/MF$2.25
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
KINETICS OF HOMOGENEOUS NUCLEATION IN MANY COMPONENT SYSTEMS.
J. O. Hirschfelder. 5 Apr 74, 23p NASA-CR-139529, WIS-TCI-510
Subm-Sponsored by NASA Prepared in Cooperation with Calif. Univ., Santa Barbara.

Descriptors: *Chemical elements, *Nucleation, *Reaction kinetics, Free energy, Potential energy, Reaction time, Thermodynamics.

For abstract, see STAR 1220

N74-31023/6GA PC$4.75/MF$2.25
Grambling State Univ., La. Dept. of Physics.
NUCLEAR QUADRUPOLE RESONANCE STUDIES IN SEMI-METALLIC STRUCTURES.
Semiannual Status Report.
A. N. Murty. 15 Aug 74, 32p NASA-CR-138306, SASR-3
Contract NGR-19-011-016

Descriptors: *Nuclear magnetic resonance, *Quadrupoles, Antimony, Arsenic, Bonding, Radio frequencies, Spectrometers, Tellurides.

For abstract, see STAR 1220

N74-31230/7GA PC$4.25/MF$2.25
Columbia Univ., New York. Astrophysics Lab.
RESEARCH ON THE PROPERTIES AND INTERACTIONS OF SIMPLE ATOMIC AND IONIC SYSTEMS.
Final Technical Report, 1 Jan. 1963 - 31 Dec. 1972.
R. Novick. Aug 74, 21p NASA-CR-139397, CAL-1263
Contract NGL-33-008-009

Descriptors: *Abstracts, *Atomic excitations, *Ionic reactions, *Research, Frequency shift, Polarized light, Ultraviolet radiation.

For abstract, see STAR 1220

N74-31273/7GA PC$15.75/MF$2.25
Technische Hochschule, Hanover (West Germany).
THE EFFECT OF HELIUM-NEON, HELIUM-NITROGEN, AND HELIUM-CARBON GAS MIXTURES ON ENCLOSED GAS TURBINE SYSTEMS DER EINFLUSS DER GASMISCHUNGEN HELIUM-NEON, HELIUM-STICKSTOFF UND HELIUM-KOHLENDIOXID AUF GESCHLOSSENE GASTURBINENANLAGEN.
Ph.D. Thesis.
R. Klein. 1973, 251p
Language in German.

Descriptors: *Cost effectiveness, *Gas mixtures, *Gas turbines, Carbon dioxide, Helium, Neon, Nitrogen, Nuclear electric power generation, Numerical analysis.

For abstract, see STAR 1220

ORO-3018-123 PC$5.00/MF$2.25
Louisiana State Univ., Baton Rouge Coates Chemical Labs.
EXCITED ELECTRONIC STATES OF THE ALPHA -DICARBONYLS.
J. F. Arnett, G. Newkome, W. L. Mattice, and S. P. McGlynn. 1973, 39p

Descriptors: (*Ketones, *Electronic structure), Absorption spectra, Aromatics, Bonding, Emission spectra, Energy levels, Energy spectra, Excited states, Phosphorescence, Programming.

For abstract, see NSA 30 08, number 23373.

ORO-3861-10 PC$4.00/MF$2.25
Tennessee Univ., Knoxville Dept. of Physics.
ELECTRONIC PROPERTIES OF LIQUIDS. ANNUAL PROGRESS REPORT, 1 NOVEMBER 1973–31 OCTOBER 1974.
L. R. Painter. 15p
Contract AT(40-1)-3861

Descriptors: (*Alkanes, *Electronic structure), (*Hydrocarbons, Electronic structure), (*Dna, Electronic structure), Absorption spectra, Albumins, Cattle, Films, Liquids, Optical properties, Oscillations, Ultraviolet radiation.

For abstract, see NSA 30 08, number 23472.

PATENT-3 797 299 Not available NTIS
Atomic Energy Commission, Washington, D.C.
METHOD OF MEASURING THE TRITIUM CONCENTRATION IN A HIGH-TEMPERATURE ENVIRONMENT.
Patent,
Paul A. Nelson, and Romesh Kumar. Filed 23 Apr 73, patented 19 Mar 74, 11p PAT-APPL-353 256
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C.

Descriptors: *Tritium, *Liquid metal coolants, *Patents, Chemical analysis.
Identifiers: PAT-CL-73-19.

This invention deals with a novel method for measuring the tritium concentration in a high-temperature environment such as liquid metal. An enclosed, thin-wall metal membrane is connected to a sweep gas source containing hydrogen in an inert carrier gas, the membrane being formed from a metal substantially inert to the high-temperature environment and through which elemental hydrogen and tritium will diffuse. The sweep gas containing the gaseous hydrogen-tritium molecules is continuously removed from the enclosed membrane and measured for tritium radioactivity, the radioactivity measurement being indicative of the tritium concentration in the high-temperature environment.

PB-235 901/6GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Fluid Mechanics Lab.
SHOCK TUBE STUDIES OF DEUTERIUM DISSOCIATION AND OXIDATION BY ATOMIC RESONANCE ABSORPTION SPECTROPHOTOMETRY,
Dirk Appel, and John P. Appleton. May 74, 36p
Pub-74-2
Grant NSF-GP-32522
Presented at International Symposium (15th) on Combustion held at Tokyo, Japan on 25-31 Aug 74.

Descriptors: *Shock waves, *Deuterium, *Dissociation, *Oxidation, Exchange reactions, Reaction kinetics, Hydrogen, Shock tubes.
Identifiers: *Atomic absorption spectroscopy.

The technique of Atomic Resonance Absorption Spectrophotometry (ARAS) was used to measure deuterium atom concentration profiles in the reaction zones behind both primary and reflected shock waves. Calibration of the ARAS technique over a wide range of D atom concentrations enabled accurate rate measurements to be made of the dissociation reaction: D2 + Ar to D + D + Ar, over the temperature range 1800 to 4000K. The rates of other reactions which included the isotope exchange reactions: H2 + D to HD + H and D2 + H to HD + D, and the sequence of oxidation reactions: O2 + D to OD + O, D2 + O to OD + D, and D2 + OD to D2O + D, were also studied at temperatures in the range 1700 to 3100K. (Modified author abstract)

RLO-2230-T-2-14 PC$4.00/MF$2.25
Oregon Univ., Eugene.
DIFFUSION CONTROLLED REACTIONS AND EXCHANGE REACTIONS IN SOLUTION. ANNUAL PROGRESS REPORT.
R. M. Noyes. 28 May 74, 10p
Contract AT(45-1)-1310

Descriptors: Biochemistry, Bromine ions, Catalysts, Cerium ions, Chemical reactions, Control, Diffusion, Malonic acid, Organic bromine compounds, Oxidation, Solutions, Solvents.

For abstract, see NSA 30 08, number 23374.

SLL-74-0013 PC$12.50/MF$2.25
Sandia Labs., Livermore, Calif.
DENSE FLUID SHEAR VISCOSITY AND THERMAL CONDUCTIVITY VIA NONEQUILIBRIUM MOLECULAR DYNAMICS.
W. T. Ashurst. Jun 74, 189p
Contract AT(29-1)-789

Descriptors: (*Fluids, *Thermal conductivity), Classical mechanics, Couette flow, Energy, Gases, Linear momentum, Mass, Molecule collisions, Self-diffusion, Shear, Simulation, Spatial distribution, Temperature dependence, Transport theory, Velocity, Viscosity.

For abstract, see NSA 30 08, number 23375.

SRO-525-7 PC$4.75/MF$2.25
South Carolina Univ., Columbia Coll. of Engineering.
ION EXCHANGE MEMBRANES. PROGRESS REPORT, OCTOBER 1, 1973–SEPTEMBER 30, 1974.
B. L. Baker. 9 Jul 74, 33p
Contract AT(38-1)-525

Descriptors: (*Copper, *Ion exchange), (*Zinc, Ion exchange), (*Iron, Ion exchange), Aqueous solutions, Cations, Copper compounds, Edta, Ion exchange materials, Iron compounds, Membranes, Sodium compounds, Zinc compounds.

For abstract, see NSA 30 08, number 23376.

UCB-34-P-20-160 PC$4.00/MF$2.25
California Univ., Berkeley Dept. of Physics.
NEAR-NUCLEI MAGNETIC RESONANCE.
J. P. Wolfe. 1973, 17p CONF-730741-1

Descriptors: (*Yttrium complexes, *Nuclear magnetic resonance), Calcium fluorides, Doped

materials, Impurities, Interactions, Monocrystals, Nuclei, Spectrometers, Spin-lattice relaxation, Yttrium sulfates.

For abstract, see NSA 30 08, number 23485.

UCLA-34-P-91-70 PC$18.50/MF$2.25
California Univ., Los Angeles Dept. of Chemistry.
LOW TEMPERATURE TRIPLET ENERGY TRAPS IN ORGANIC SOLIDS USING PHOSPHORESCENCE-MICROWAVE DOUBLE RESONANCE SPECTROSCOPY: MONOMER AND EXCIMER. PART II. ANNUAL REPORT, SEPTEMBER 15, 1973–SEPTEMBER 14, 1974.
C. T. Lin. May 74, 307p
Contract AT(04-3)-34

Descriptors: (*Organic chlorine compounds, *Excited states), (*Aromatics, Excited states), Crystals, Microwave radiation, Phosphorescence, Polarization, Resonance, Spectroscopy, Traps, Triplets, Ultralow temperature.

For abstract, see NSA 30 08, number 23379.

UCLA-34-P-91-71 PC$4.00/MF$2.25
California Univ., Los Angeles Dept. of Chemistry.
PHOSPHORESCENCE-MICROWAVE MULTIPLE RESONANCE SPECTROSCOPY OF POLYATOMIC MOLECULES. PART I. ANNUAL REPORT, SEPTEMBER 15, 1973–SEPTEMBER 14, 1974.
M. A. El-Sayed. May 74, 14p
Contract AT(04-3)-34

Descriptors: (*Aromatics, *Excited states), Energy-level transitions, Microwave radiation, Molecules, Phosphorescence, Research programs, Resonance, Reviews, Spectroscopy, Traps, Triplets.

For abstract, see NSA 30 08, number 23380.

UCRL-13598 PC$4.00/MF$2.25
Saint Cloud State Coll., Minn. Dept. of Chemistry.
GASEOUS METAL HYDROXIDES AT HIGH TEMPERATURES. FINAL REPORT FOR THE YEAR ENDED NOVEMBER 15, 1973.
J. H. Carpenter. 1973, 11p

Descriptors: (*Hydroxides, *Diffusion), (*Lead hydroxides, *Thermodynamic properties), Contamination, Enthalpy, Environment, Metals, Pollution.

For abstract, see NSA 30 08, number 20688.

UCRL-51577 Pt.1 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
SYSTEM FOR PLUTONIUM ANALYSIS BY GAMMA RAY SPECTROMETRY. PART I. TECHNIQUES FOR ANALYSIS OF SOLUTIONS.
R. Gunnink, J. B. Niday, and P. D. Siemens. 18 Apr 74, 26p
Contract W-7405-eng-48

Descriptors: (*Plutonium, *Gamma spectroscopy), (*Plutonium 238, Gamma spectroscopy), (*Plutonium 239, Gamma spectroscopy), (*Plutonium 240, Gamma spectroscopy), Americium 241, Calibration, Chemical analysis, Isotope ratio, Plutonium 241, Quantitative chemical analysis, Radiometric analysis, Solutions.

For abstract, see NSA 30 08, number 20645.

UCRL-75567 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
RARE EARTHS AND ION EXCHANGE.
D. H. Sisson, and V. A. Mode. 21 Mar 74, 7p
CONF-741002-9

Descriptors: (*Rare earths, *Ion exchange chromatography), Hydroxy acids, Monocarboxylic acids.

For abstract, see NSA 30 08, number 20662.

UCRL-75708 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
ELECTRON EXCITATION OF HIGH PRESSURE AR, KR, AND XE.
P. J. Ebert, H. A. Koehler, L. J. Ferderber, and D. L. Redhead. 21 May 74, 6p CONF-740711-3

Descriptors: (*Argon, *Electron-atom collisions), (*Krypton, Electron-atom collisions), (*Xenon, Electron-atom collisions), Decay, Energy spectra, Pressure dependence, Relativistic range, Time dependence.

For abstract, see NSA 30 08, number 22183.

ZFK-253 PC$8.25/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
GASEQUILIBRIUM OF THE SYSTEM F-O-H.
H. Gruenberg, and E. Mueller. May 73, 102p
In German. U.S. Sales Only.

Descriptors: (*Fluorine, *Phase studies), (*Oxygen, Phase studies), (*Hydrogen, Phase studies), (*Uranium oxides, *Phase diagrams), Computer calculations, Equilibrium, Uranium fluorides, Uranium hydrides.

For abstract, see NSA 30 08, number 20689.

7E. Radio and Radiation Chemistry

AD-785 678/4GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J Feltman Research Labs
X-RAY PHOTOELECTRON SPECTROSCOPY OF EXPLOSIVE SOLIDS,
Jagadish Sharma, Thaddeus Gora, Suryanarayana Buhusu, and Donald A. Wiegand. 1974, 16p

Descriptors: *Explosives, Pyrolysis, Photolysis, Decomposition, Solids, Electronic states, Molecular energy levels, Azides, Organic compounds, Aging(Materials), Solid propellants, Photoelectric emission, X rays.
Identifiers: *X ray photoelectron spectroscopy, Photoelectron spectroscopy.

A wide-ranging program to apply the new technique of X-ray photoelectron spectroscopy to the study of explosive solids is described, along with major findings to date. Significant general contributions are summarized: (a) The potential importance of a new powerful and versatile spectroscopy was recognized in the XPS technique, and the in-house capability for using it to pursue Army research interests was developed. (b) The XPS technique was brought to bear on solids of primary importance to the Army, particularly to explosives, propellants and related compounds. Results of these studies, coupled with molecular orbital calculations performed by us and by others, have led to new fundamental knowledge of their electronic structure, reaction mechanisms, and of microscopic processes involved in rapid decomposition. (c) The potential utility of XPS for immediate application to Army and forensic problems was recognized and developed.

AD-785 819/4GA Reprint
Pittsburgh Univ Pa Dept of Physics
THEORY OF RESONANT MULTIPHOTON PROCESSES,
C. S. Chang. 7 Nov 73, 9p AROD-10271.6-P
Grant DAHC04-74-G-0092
Availability: Pub. in Physical Review A, v9 n5 p1769-1775 May 74.

Descriptors: *Photoionization, *Cesium, *Hydrogen, Quantum theory, Electron transitions, Atoms, Resonance, Atomic beams, Gas ionization, Metal vapors.
Identifiers: Quantum electrodynamics, *Multiphoton absorption, Line widths.

The paper applies the method of high-intensity quantum electrodynamics developed earlier to several problems of current experimental interest. The intensity-dependent shifts and widths of atomic levels are calculated and applied to a given transition near resonance. The technique is demonstrated with three examples: the multiphoton ionization of atomic cesium and hydrogen in atomic beams and third-harmonic production in an atomic vapor. It is found that the multiphoton-ionization rate in a relatively weak laser beam is determined by the intensity-dependent level width (6f configuration) as well as the interference of the fine-structure states, and that the rates for hydrogen, in a much more intense beam are determined by the intensity-dependent widths and shifts as well as the wave-function renormalization constants. For third-harmonic production the role of two-photon resonance is emphasized, and the dependence of the generated third-harmonic intensity on the intensity and frequency of the fundamental is discussed. Near resonance, the ratio of third-harmonic intensity to fundamental intensity saturates. (Modified author abstract)

AD-785 934/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
RADIOLYSIS OF AMMONIUM PERCHLORATE ON EXPOSURE TO X-RAYS,
V. A. Nevostruev, Yu. A. Zakharov, and V. V. Anikeeva. 7 Sep 73, 7p Rept no. FSTC-HT-23-1101-73
Trans. of Politekhnicheskii Institut, Tomsk. Izvestiya (USSR) v199 p80-83 1969.

Descriptors: *Ammonium perchlorate, *Radiolysis, X rays, Translations, USSR.

In the radiolysis of NH4ClO4 on exposure to 0.18 Mev x-rays, the primary radiolysis product of ClO4(-) is the ClO3(-) ion. The radiation-chemical yields for the radiolysis products are reported.

AD-785 974/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
APPARATUS FOR STUDYING RADIATION AND THERMOSTIMULATED LUMINESCENCE BY ELECTROCONDUCTIVITY IN PARALLEL WITH MASS SPECTROMETRY OF DECOMPOSITION PRODUCTS,
Yu. A. Zakharov, and S. I. Rukoleev. 21 Sep 73, 6p Rept no. FSTC-HT-23-1087-73
Trans. of Politekhnicheskii Institut, Tomsk. Investiya (USSR) n251 p115-119 1970.

Descriptors: *Thermoluminescence, *Laboratory equipment, *Radiolysis, X rays, Mass spectroscopy, Pyrolysis, USSR, Translations.
Identifiers: *X ray fluorescence.

The apparatus described here is capable of determining in high vacuum, using light filters, the spectrum of x-ray and thermal luminescence in the 200-800 nm region, melting points in the -190 to 400C range, recording of thermal luminescence curves upon excitation both with x-ray radiation as well as with light, analysis of liberated gaseous products of processes occurring during radiation and heating, and measurement of x-ray and thermostimulated currents.

AD-786 092/7GA Reprint
Colorado Univ Boulder
LASER PHOTODETACHMENT OF NO2(-),
E. Herbst, T. A. Patterson, and W. C. Lineberger. 18 Mar 74, 6p
Grants DA-ARO-D-31-124-73-G208, NSF-GP-39308

Availability: Pub. in Jnl. of Chemical Physics, v61 n4 p1300t1304, 15 Aug 74.

Descriptors: *Nitrites, Cross sections, Dye lasers, Laser beams, Molecular isomerism, Nitrogen oxides.
Identifiers: *Photodetachment, Electron affinity.

An absolute apparent cross section for the photodetachment of nitrite (NO2(-)) ions has been measured in the region (2.0-2.7) eV using a tunable dye laser as the light source. The electron affinity of nitrogen dioxide (NO2) has been determined. Photodetachment of an ion though to be a peroxy isomer of (NO2(-) has also been observed. (Modified author abstract)

AD-786 105/7GA Reprint
Wisconsin Univ Madison Dept of Chemistry
ENTANGLEMENT NETWORKS OF 1,2-POLYBUTADIENE CROSS-LINKED IN STATES OF STRAIN. I. CROSS-LINKING AT 0 DEG,
Ole Kramer, Rick L. Carpenter, Violeta Ty, and John D. Ferry. 1 Oct 73, 8p AROD-9479.13-C
Grant DA-ARO-D-31-124-73-G48
Availability: Pub. in Macromolecules, v7 p79-84 Jan/Feb 74.

Descriptors: *Polybutadiene, *Crosslinking(Chemistry), Networks, Gamma rays, Chemical structure, Elastic properties, Viscoelasticity.

Linear 1,2-polybudadiene is cross-linked by gamma-irradiation while strained in simple extension, with extension ratios from 1.2 to 2.0. After release, the sample retracts to a state of ease at room temperature. The molar concentrations of network strands terminated by cross-links and by trapped entanglements are calculated by composite network theories of Flory and others. Young's modulus was also calculated indirectly from equilibrium swelling in n-heptane. (Modified author abstract)

AD-786 131/3GA Reprint
North Carolina Univ Chapel Hill William R Kenan Jr Labs of Chemistry
PHOTOIONIZATION STUDY OF THE IONIZATION POTENTIALS AND FRAGMENTATION PATHS OF THE CHLORINATED METHANES AND CARBON TETRABROMIDE,
Arthur S. Werner, Bilin P. Tsai, and Tomas Baer. 25 Jan 74, 10p AROD-10200.2-C
Grant DA-ARO-D-31-124-72-G20
Availability: Pub. in Jnl. of Chemical Physics, v60 n9 p3650-3657, 1 May 74.

Descriptors: *Photoionization, *Carbon tetrachloride, Quantum efficiency, Mass spectra, Ultraviolet radiation, Ionization potentials.
Identifiers: *Chloromethanes, *Carbon tetrabromide.

The photoionization yields of CH3Cl, Ch2Cl2, CHCl3, CCl4, and CBr4 have been measured in the 10-13.5 eV energy range. Ionization potentials and fragment appearance potentials derived from a detailed study of the hot band contribution at 300K have been obtained. Although CCl4(+) is apparently unstable, CBr4(+) is stable. Fragmentation of the chlorinated and brominated methanes in the energy range studied appears to be limited to halogen loss, even though hydrogen loss is in certain cases energetically favored. An argument based on the symmetry of the fragments and the transition state producing these fragments is proposed to account for this observation. (Modified author abstract)

AD-786 152/9GA Reprint
Pittsburgh Univ Pa Dept of Chemistry
CALCULATED PHOTOIONIZATION CROSS SECTIONS AND RELATIVE EXPERIMENTAL PHOTOIONIZATION INTENSITIES FOR A SELECTION OF SMALL MOLECULES,
J. Wayne Rabalais, Thomas P. Debies, Jeffrey L. Berkosky, Jan-Tsyu J. Huang, and Frank O. Ellison. 18 Feb 74, 15p AROD-11601.1-C
Grants DAHC04-74-G-0039, NSF-GU-3184
Availability: Pub. in Jnl. of Chemical Physics, v61 n2 p516-528, 15 Jul 74.

Descriptors: *Photoionization, *Cross sections, Hydrogen, Methane, Nitrogen, Carbon monoxide, Water vapor, Hydrogen sulfide, Ethylene, Ultraviolet radiation, X rays, Differential cross sections, Computations, Computer applications, Experimental data.

The general equations for calculating photoionization cross sections of polyatomic molecules in the plane-wave and orthogonalized plane-wave approximations have been programmed for the electronic computer. Applications are described for the molecules H2, CH4, N2, CO, H2O, H2S, and H2CCH2 for incident photon energies from threshold to 1500 eV. Relative experimental photoionization band intensities for the above molecules are measured using NeI, HeI, and HeII resonance radiation. A simplified analysis of the intensities derived from electrostatic deflection analyzers is presented. The doublet P(3/2):doublet P(1/2) intensity ratios of the rare gases are determined with the three modes of excitation mentioned above. An analysis of the resolution capabilities of an electrostatic deflection spectrometer as a function of electron kinetic energy is presented. Relative experimental photoionization band intensities for the above molecules obtained by ionization with the three uv sources and MgK(alpha) and AlK(alpha) x-ray sources are compared with computed differential cross sections. Variations in computed cross sections as a function of the kinetic energy of the photoelectrons are discussed and possible interpretations are proposed. (Author)

AD-786 275/8GA Reprint
Pittsburgh Univ Pa Dept of Chemistry
CALCULATED ANGULAR DISTRIBUTIONS OF PHOTOELECTRONS USING THE ORTHOGONALIZED PLANE-WAVE APPROXIMATION,
J. Wayne Rabalais, Thomas P. Debies, Jeffrey L. Berkosky, Jan-Tsyu J. Huang, and Frank O. Ellison. 18 Feb 74, 6p AROD-11601.2-C
Grants DAHC04-74-G-0039, NSF-GU-3184
Availability: Pub. in Jnl. of Chemical Physics, v61 n2 p529-533, 15 Jul 74.

Descriptors: *Photoelectric emission, *Methane, *Water, *Nitrogen, Photoelectrons, Angles, Distribution, Mathematical models.
Identifiers: Orthogonalized plane wave theory.

The general equations for calculating angular distributions of photoelectrons within the orthogonalized plane-wave approximation have been programmed for the electronic computer. Applications are described for the molecules CH4, H2O, and N2 with incident photon energies from threshold to 1254 eV. Computed values of the asymmetry parameter beta are compared to experimentally determined beta values using HeI excitation. Large variations beta as a function of photon energy are obtained; possible interpretations are proposed. (Modified author abstract)

AERE-R-4987 PC$6.75/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
RADIOLYTIC REACTION BETWEEN GRAPHITE AND CARBON DIOXIDE. PART 5. GAS FLOW EXPERIMENTS IN DIDO: FURTHER EXPERIMENTS ON THE EFFECT OF METHANE.
D. A. Dominey, H. Morley, and R. J. Waite. Jul 67, 74p
U.S. Sales Only.

Descriptors: (*Graphite, *Radiation chemistry), (*Carbon dioxide, Radiation chemistry), Dido reactor, Dose rates, G value, Gas flow, Inhibition, Methane, Oxidation, Pressure dependence, Radiolysis, Temperature dependence.

For abstract, see NSA 30 08, number 20734.

BNWL-SA-4830 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
SOLID PLUTONIUM NITRATE SHIPPING FORMS.
G. H. Bryan, and J. L. Ryan. 1974, 10p CONF-740901-2

Descriptors: (*Plutonium nitrates, *Transport), Ammonium compounds, Carbon dioxide, G value, Hydrogen, Nitric acid, Nitrogen, Nitrogen oxides, Oxygen, Potassium nitrates, Radiolysis, Solubility, Stability.

For abstract, see NSA 30 08, number 20784.

CALT-767P4-134 PC$6.75/MF$2.25
California Inst. of Tech., Pasadena.
STUDIES IN CHEMICAL DYNAMICS AND RADIATION CHEMISTRY. TECHNICAL PROGRESS REPORT, 1 JULY 1973--30 JUNE 1974.
A. Kuppermann. 30 Jun 74, 74p
Contract AT(04-3)-767

Descriptors: (*Water, *Radiolysis), (*Solvated electrons, *G value), (*Radiation chemistry, *Research programs), Chemical reaction kinetics, Electron beams.

For abstract, see NSA 30 08, number 20735.

COM-74-50852/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MATRIX-ISOLATION STUDY OF THE VACUUM-ULTRAVIOLET PHOTOLYSIS OF NF3. THE ELECTRONIC SPECTRUM OF THE NF2 FREE RADICAL.
Final rept.,
Marilyn E. Jacox, Dolphus E. Milligan, William A. Guillory, and Jerry J. Smith. 1974, 6p
Pub. in Jnl. of Molecular Spectroscopy, v52 p322-327 1974.

Descriptors: *Photolysis, *Free radicals, *Ultraviolet spectra, Spectrum analysis, Molecular energy levels, Far ultraviolet radiation, Infrared spectra.
Identifiers: *Nitrogen fluoride(NF3), Matrix isolation techniques, *Nitrogen fluoride(NF2), Photodetachment.

The vacuum-ultraviolet photolysis of NF3 in an argon or a carbon monoxide matrix at 14K leads to the production of NF2, identified by its infrared absorption. F-atom photodetachment also leads to the appearance of FCO in the carbon monoxide matrix studies. The photodissociation of NF2 by 2537-A radiation has been confirmed. The appearance of a band system near 2600 A with position and band spacings close to those previously reported for NF2 in the gas phase demonstrates that the lower state of the gas-phase transition is the ground state of the molecule and confirms the assignment of the observed structure to a progression in the upper-state bending vibration.

COM-74-50874/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PHOTOLYSIS OF ALKYL IODIDES AT 147.0 NM. THE REACTION H + C(N)H(2N+1)I YIELDS HI + C(N)H(2N+1).
Final rept.,
R. E. Rebbert, S. G. Lias, and P. Ausloos. 1973, 16p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in International Jnl. of Chemical Kinetics, v5 p893-908 1973.

Descriptors: *Photolysis, *Iodoalkanes, Quantum efficiency, Far ultraviolet radiation.
Identifiers: Chemical reaction mechanisms.

The 147 nm (8.4 eV) photolysis of gaseous C2H5I, n-C3H7I and sec-C3H7I is investigated in the presence of and absence of HI. The dissociative processes occur mainly as a result of initial cleavage of the weak C-I bond, followed by decomposition of the internally excited alkyl radicals. There is also evidence for the elimination of HI as well as for C-C cleavage in the primary dissociation.

COM-74-50876/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PHOTOIONIZATION OF N2O AT 73.6-74.4 AND 58.4 NM. EVIDENCE FOR COLLISION-INDUCED DISSOCIATION AT THERMAL KINETIC ENERGIES.
Final rept.,
L. W. Sieck, and R. Gorden, Jr. 15 Mar 73, 2p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in Jnl. of Chemical Physics, v58 n6 p2653-2654, 15 Mar 73.

Descriptors: *Nitrogen oxide(N2O), *Dissociation, Mass spectroscopy, Particle collisions, Molecular energy levels.
Identifiers: *Photoionization, Atom ion interactions.

The photoionization of N2O at 73.6-74.4 and 58.4 nm has been investigated in the NBS high pressure mass spectrometer up to approximately 0.1 torr. Evidence has been found for the collision-induced dissociation N2O(+)(*) + M to NO(+) + N + M which occurs at thermal kinetic energies. Experiments with various additive gases have revealed that initial population of the A doublet Sigma level on B doublet P; and C doublet Sigma results in formation of the N2O(+) states responsible for the dissociation.

COM-74-50877/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FORMATION OF ASSOCIATION IONS IN THE PHOTOIONIZATION OF ALKYL HALIDES.
Final rept.,
L. W. Sieck, and R. Gorden, Jr. May 73, 9p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in International Jnl. of Chemical Kinetics, v5 n3 p445-454 May 73.

Descriptors: *Haloalkanes, *Dissociation, Mass spectroscopy, Dimers.
Identifiers: *Photoionization.

The methyl and ethyl chlorides and bromides, as well as methyl iodide, have been photoionized at several wavelengths in the vacuum ultraviolet at 300 K in a mass spectrometer over the pressure range 0.5 to approximately 100 mtorr. Under these conditions stabilized parent ion dimers are found in CH3Br, CH3I, and C2H5Br, but not in the chlorides. Lower limits for the dissociative lifetimes of the ion-molecule collision complexes have been estimated. An increase in photon energy (internal energy content of the reactant ion) decreases the dissociative lifetime of the collision complex.

COM-74-50889/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PRIMARY PROCESSES IN THE PHOTOLYSIS OF PROPANE: THE USE OF HI AS A RADICAL SCAVENGER.
Final rept.,
P. Ausloos, R. E. Rebbert, and S. G. Lias. 1974, 17p
Pub. in Jnl. of Photochemistry, v2 p267-283 1973/74.

Descriptors: *Propane, *Photolysis, *Hydrogen iodide, Free radicals, Denterium compounds, Far ultraviolet radiation, Scavengers(Materials), Chemical bonds.
Identifiers: Insertion reactions.

The photolysis of C3D8 has been investigated with 8.4, 10.0, and 11.6-11.8 eV photons, using HI to scavenge the radicals through the reaction: RD + HI to RDH + I (where RD is a fully deuterated alkyl or alkenyl radical). HI is a more efficient radical scavenger than H2S. The results are discussed with particular emphasis on determining whether the primary processes include direct C-C and C-H bond cleavage. The examination includes the effects of HI concentration, conversion, and pressure on the yield of ethyl radicals intercepted. It is noted that the relative importances of primary processes involving breaking of the C-C bond do not change with energy, and it is thus suggested that they all occur from an excitation in the C-C bond, and that RRKM considerations relating to equipartition of energy are not applicable to the dissociations of electronically excited alkanes. The insertion of methylene into a primary C-H bond of C3H8 to give n-butane is examined, and information concerning the internal energy of the CH2 species is derived and discussed in terms of the primary dissociation of propane.

COM-74-50890/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PHOTOIONIZATION OF SIMPLE HYDROCARBONS AT 73.6-74.4 AND 58.4 NM. COMPARISON WITH PENNING IONIZATION.
Final rept.,
L. W. Sieck, and R. Gorden, Jr. 15 Apr 73, 4p
Pub. in Chemical Physics Letters, v19 n4 p509-512, 15 Apr 73.

Descriptors: *Methane, *Ethane, *Propane, *Acetylene, Mass spectra, Deuterium compounds, Far ultraviolet radiation, Molecular energy levels.
Identifiers: *Photoionization, Penning effect.

Ionic fragmentation patterns have been determined for CH4, CD4, C2H2, C2H6, and C3H8 following photoabsorption at 73.6-74.4 (16.7-16.9 eV) and 58.4 nm (21.2 eV). These mass spectra have been compared with previous spectra obtained via Penning ionization processes involving collisions of these same molecules with metastable Ne (16.6-16.7 eV) and He (19.8-20.6 eV). On the basis of this comparison it is concluded that the molecular ions produced in Penning ionization have a higher internal energy content than is produced by photoionization at the same energy.

COO-1170-197 PC$7.25/MF$2.25
Michigan Univ., Ann Arbor Dept. of Chemistry.
ARC CHEMICAL THERMODYNAMICS. FINAL REPORT.
E. F. Jr. Westrum. 30 Dec 73, 81p
Contract AT(11-1)-1149

Descriptors: (*Uranium compounds, *Specific heat), (*Rare earth compounds, Specific heat), (*Thermodynamics, *Research programs), Calorimetry, Crystals, Antimony compounds, Arsenic compounds, Bismuth compounds, Borides, Bromides, Chlorides, Enthalpy, Iron compounds, Molybdates, Spinels, Tungstates, Acenaphthene, Azulene.

For abstract, see NSA 30 08, number 20785.

COO-3117-3 PC$4.00/MF$2.25
Brandeis Univ., Waltham, Mass.
PHOTOCHEMICAL REACTIONS OF COMPLEX MOLECULES IN CONDENSED PHASE. PROGRESS REPORT, MAY 1, 1972–APRIL 30, 1973.
H. Linschitz. 1 Mar 73, 12p
Contract AT(11-1)-3117

Descriptors: (*Photochemistry, *Research programs), (*Phytochromes, Photochemistry), (*Ketones, *Reduction), Complexes, Excited states, Molecules, Solutions, Triplets.

For abstract, see NSA 30 08, number 23352.

COO-3117-4 PC$5.25/MF$2.25
Max-Planck-Institut fuer Biophysikalische Chemie (Karl-Friedrich-Bonhoefer-Inst.), Goettingen (F.R. Germany); Brandeis Univ., Waltham, Mass. Dept. of Chemistry.
REACTION PATTERNS AND KINETICS OF THE PHOTOCONVERSION OF N-METHYLDIPHENYLAMINE TO N-METHYLCARBAZOLE.
E. W. Foerster, K. H. Grellmann, and H. Linschitz. 1 Mar 73, 43p
Contract AT(11-1)-3117

Descriptors: (*Amines, *Photolysis), (*Carbazoles, *Chemical reaction yield), Chemical reaction kinetics, Oxidation, Photon beams, Triplets.

For abstract, see NSA 30 08, number 23353.

COO-3326-28 PC$4.00/MF$2.25
Martin Marietta Corp., Baltimore, Md.
PHOTOCHEMISTRY AND ENZYMOLOGY OF PHOTOSYNTHESIS. ONE YEAR TECHNICAL PROGRESS REPORT, AUGUST 1, 1973–JULY 31, 1974.
B. Kok. 1974, 18p
Contract AT(11-1)-3326

Descriptors: Chemical reactions, Chloroplasts, Enzymes, Oxygen, Photochemistry, Photosynthesis, Plant cells.

For abstract, see NSA 30 08, number 23354.

DP-MS-74-4 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
FISSION FRAGMENT RADIOLYSIS OF 0.4M SULFURIC ACID SOLUTIONS WITH DISSOLVED EXP 252 CF.
N. E. Bibler. 1974, 19p CONF-740715-5
Contract AT(07-2)-1

Descriptors: (*Sulfuric acid, *Radiolysis), (*Cerium compounds, *G value), (*Iron compounds, G value), (*Hydrogen, G value), Absorption spectroscopy, Alpha particles, Californium 252, Chemical radiation effects, Curium 244, Fission fragments, Hydrogen peroxide, Hydroxyl radicals, Let, Peroxy radicals.

For abstract, see NSA 30 08, number 20736.

HMI-B-148 PC$7.75/MF$2.25
Hahn-Meitner-Institut fuer Kernforschung Berlin G.m.b.H. (F.R. Germany).
PULSE RADIOLYSIS AND POLAROGRAPHY, A REVIEW.
A. Henglein. Jun 74, 91p
U.S. Sales Only.

Descriptors: (*Radiolysis, *Reviews), (*Polarography, Reviews), Chemical reaction kinetics, Organic compounds, Pulsed irradiation, Radicals.

For abstract, see NSA 30 08, number 20737.

JAERI-M-5524 PC$4.75/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
PHYSICAL PROPERTIES OF THE POWDER POLYETHYLENE PRODUCED BY RADIATION-INDUCED POLYMERIZATION (TAKATHENE).
Jan 74, 32p
In Japanese. U.S. Sales Only.

Descriptors: (*Ethylene, *Chemical radiation effects), Adsorption, Adsorption heat, Distribution, Electric charges, Gases, Irradiation, Particle size, Polyethylenes, Polymerization, Porosity, Powders, Shear properties, Sintering, Solvents.

For abstract, see NSA 30 08, number 20743.

JAERI-M-5577 PC$4.00/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
MECHANICAL PROPERTIES OF RADIATION-POLYMERIZED POLYETHYLENE.
T. Sugo, M. Takehisa, and S. Machi. Mar 74, 19p
In Japanese. U.S. Sales Only.

Descriptors: (*Ethylene, *Chemical radiation effects), (*Polyethylenes, *Tensile properties), Creep, Crystallization, Impact strength, Irradiation, Molecular weight, Polymerization, Temperature dependence, Thermal fatigue.

For abstract, see NSA 30 08, number 20744.

JAERI-M-5593 PC$4.00/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
RADIATION-INDUCED EMULSION COPOLYMERIZATION OF TETRAFLUOROETHYLENE WITH PROPYLENE.
O. Matsuda, J. Okamoto, N. Suzuki, and M. Ito. Mar 74, 15p
In Japanese. U.S. Sales Only.

Descriptors: (*Alkenes, *Chemical radiation effects), (*Fluorinated aliphatic hydrocarbons, Chemical radiation effects), (*Propylene, Chemical radiation effects), (*Latex, *Chemical preparation), Copolymerization, Emulsifiers, Emulsions, Physical properties, Polymerization, Stability.

For abstract, see NSA 30 08, number 20745.

JAERI-1233 PC$6.25/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
RADIATION-INDUCED POLYMERIZATION OF ETHYLENE IN PRECIPITATING SYSTEM.
T. Wada, T. Watanabe, M. Takehisa, and S. Machi. Mar 74, 64p
In Japanese. U.S. Sales Only.

Descriptors: (*Ethylene, *Chemical radiation effects), Activation energy, Butanols, Chemical reaction kinetics, Cyclohexane, Dose rates, Ethanol, G value, Gamma radiation, Irradiation, Medium temperature, Molecular weight, Organic solvents, Polyethylenes, Polymerization, Pressure dependence, Time dependence, Viscosity, Water.

For abstract, see NSA 30 08, number 20739.

JINR-P12-7758 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
CHEMICAL EFFECTS CONNECTED WITH VARIOUS PROCESSES OF RADIOACTIVE DECAY OF CE ISOTOPES IN COMPLEXES WITH POLYAMINE–POLYCARBOXYLATE CHELATE LIGANDS.
G. U. Beyer, E. Herrmann, and V. A. Khalkin. 1974, 30p
In Russian. U.S. Sales Only.

Descriptors: (*Cerium 144, *Beta-minus decay), (*Cerium 143, Beta-minus decay), (*Cerium 137, *Energy-level transitions), (*Cerium 135, *Electron capture decay), Amines, Beta decay, Capture, Carboxylic acid salts, Cerium complexes, Cerium 134, Chemical state, Electrons, Energy levels, Isomeric transitions, Lanthanum 134, Lanthanum 135, Praseodymium 143, Praseodymium 144, Radiochemistry.

For abstract, see NSA 30 08, number 20786.

LA-UR-74-954 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
HYDROUS OXIDE COMPOSITIONS OF RARE EARTH (III) CATIONS AND MIXED VALENCE CHROMIUM (III), (V), (VI).
E. I. Onstott, and R. C. Heaton. 1974, 6p CONF-741002-7
Contract W-7405-eng-36

Descriptors: (*Europium compounds, *Chemical preparation), (*Gadolinium compounds, Chemical preparation), Chromates, Hydrates, Potassium compounds.

For abstract, see NSA 30 08, number 20787.

MLM-2153 PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.
PLUTONIUM-238 DIOXIDE DISSOLUTION STUDY.
D. E. Etter, and W. R. Herald. 31 Jul 74, 8p
Contract AT-33-1-GEN-53

Descriptors: (*Plutonium dioxide, *Dissolution), High temperature, Hydrofluoric acid, Isotope enriched materials, Nitric acid, Plutonium 238, Quantity ratio.

For abstract, see NSA 30 08, number 20788.

PB-235 503/0GA PC$7.50/MF$2.25
Boston Univ., Mass. Dept. of Chemistry.
PHOTOCHEMICAL CONVERSION OF SOLAR ENERGY.
Quarterly progress rept. (1st), 1 Jan-31 Mar 74, Norman N. Lichtin. 30 Apr 74, 229p
NSF/RANN/SE/GI-38103/PR/74/1 NSF/RA/N-74-046
Grant NSF-GI-38103

Descriptors: *Photovoltaic cells, *Electrolytes, *Iron organic compounds, Reaction kinetics, Photochemical reactions, Organic solvents, Electrodes, Complex compounds, Acetamides, Molecular energy levels, Excitation, Charge transfer, Solar cells.
Identifiers: Metal complexes, Phenothiazine/amino-3-imino, *Photogalvanic cells.

Work was continued on the iron-thionine photogalvanic cell. Thin layer wholly illuminated photogalvanic cells were constructed using NESA and platinum electrodes. In some of these cells, the electrolyte consisted of iron-thionine solution absorbed on a polyelectrolyte membrane. Evaluation of the performance of cells using aqueous-organic mixtures as solvents was pursued. A number of kinetic parameters were evaluated employing solution in solvents composed of various proportions of water and dimethylacetamide (DMA). Using the technique of pulsed laser photolysis-kinetic spectrometry, it was found that in aqueous solution semithionine appears to be generated in part by reaction of discreet molecules of triplet thionine with Fe(II) and in part by electron transfer within excited complexes of thionine and Fe(II).

RRL-3238-488 PC$4.25/MF$2.25
Mellon Inst., Pittsburgh, Pa. Radiation Research Labs.
QUARTERLY REPORT, APRIL 1, 1974–JUNE 30, 1974.
5 Jul 74, 23p
Contract AT(11-1)-3238

Descriptors: (*Radiation chemistry, *Research programs), (*Phenyl radicals, *Electron spin resonance), (*Surfactants, *Radiolysis), (*Quinones, Radiolysis), Alkyl radicals, Aqueous solutions, Electron transfer, Folic acid, Imidazoles, Nitro compounds, Nitrobenzene, Pulsed irradiation, Solvated electrons, Vitamin k.

For abstract, see NSA 30 08, number 20748.

UCRL-75696 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
TWO-STEP SELECTIVE PHOTOIONIZATION OF EXP 235 U IN URANIUM VAPOR.
S. A. Tuccio, J. W. Dubrin, O. G. Peterson, and B. B. Snavely. 12 Jun 74, 12p CONF-740617-6

Descriptors: (*Uranium 235, *Photoionization), Cross sections, Excited states, Laser radiation, Lasers, Lifetime, Vapors, Visible radiation.

For abstract, see NSA 30 08, number 20789.

ZFK-251 PC$4.00/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
PREPARATION OF TRITIUM LABELLED ORGANIC COMPOUNDS BY THE WILZBACH METHOD.
J. Roemer. May 73, 20p
In German. U.S. Sales Only.

Descriptors: (*Organic compounds, *Labelling), (*Tritium, *Radiochemistry), Chemical reactions, Hot atom chemistry, Isotopic exchange, Wilzbach method.

For abstract, see NSA 30 08, number 20780.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-785 751/9GA Reprint
Johns Hopkins Univ Baltimore Md
UNDERWATER OBSERVATION INCREASES UNDERSTANDING OF MARINE MAMMALS.
Technical rept.,
G. Carleton Ray. 1 Sep 74, 8p Rept no. TR-5
Contract N00014-67-A-0163-0010
Availability: Pub. in Marine Technology Society Jnl., v7 n1 p16-20 1973.

Descriptors: *Aquatic animals, Marine biology, Ecology, Mammals, Carnivora, Seals(Mammals).
Identifiers: Leptonychotes weddelli, Phoca hispida, Odobenus rosmarus, *Marine mammals, Animal behavior.

Manned undersea techniques have recently allowed direct visual observation of the underwater behavior and environments of marine mammals. This paper mentions several examples of observations by other workers and reviews three cases in which the writer has observed marine mammal behavior, their environment, or environmental effects due to their activities. The first example is the Weddell seal, Leptonychotes weddelli, for which underwater observations have increased our understanding of its use of sound and posturing in dominance hierarchies. Second, in the case of the ringed seal, Phoca (Pusa) hispida, questions about orientation to the underwater entrance to its den have been clarified. The overall conclusion is that manned observation can clarify much about the underwater lives of marine mammals; such observations are most useful when integrated with observations by other means. (Modified author abstract)

AD-785 752/7GA Reprint
Johns Hopkins Univ Baltimore Md
FEEDING OF A CAPTIVE GRAY WHALE, 'ESCHRICHTIUS ROBUSTUS'.
Technical rept.,
G. Carleton Ray, and William E. Scheville. 1 Sep 74, 11p Rept no. TR-6
Contract N00014-67-A-0163-0010
Prepared in cooperation with Woods Hole Oceanographic Institution, Mass.
Availability: Pub. in Marine Fisheries Review, v36 n4 p31-38 Apr 74, MFR Paper 1053.

Descriptors: *Whales, Aquatic animals, Cetacea, Behavior, Feeding.
Identifiers: California gray whales, Eschrichtius robustus, *Feeding habits, Animal behavior, *Marine mammals.

The feeding of a captive yearling female Eschrichtius robustus was observed while diving

with her as well as from the surface. She sucked food off the bottom while swimming tipped over 120 degrees so that her cheek was nearly parallel to the bottom. An increase in mouth volume is apparently caused by action of the tongue, resulting in strong suction, during which the lower lip is opened and food enters the mouth. How food is separated from water and mud or detritus is not known. The observed behavior is probably natural and illuminates earlier records of stomach contents, external markings, and asymmetrical baleen. Clearly, much needs to be learned about the mechanism of feeding of baleen whales. This species' feeding habits may be unique among them. (Author)

COM-74-50849-02/GA
(Order as COM-74-50849)
Tokai Regional Fisheries Research Lab., Yokosuka (Japan). Mariculture Div.
MARICULTURE OF SEAWEEDS AND ITS PROBLEMS IN JAPAN,
Shunzo Suto. Feb 74, 11p NOAA-74080201-2
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p7-16 Feb 74, COM-74-50849.

Descriptors: *Sea grasses, *Aquaculture, Aquatic plants, Algae, Cultivation, Coasts, Japan.

The mariculture of seaweeds and its problems in Japan are discussed. Information is given on Porphyra, Undaria, Laminania, Gelidium and other agar weeds. The biology, harvesting and culture techniques as well as problems in propagation protection are detailed.

COM-74-50849-12/GA
(Order as COM-74-50849)
National Oceanic and Atmospheric Administration, Rockville, Md. Office of Sea Grant.
SEAWEED CULTURE IN JAPAN,
Robert Wildman. Feb 74, 6p NOAA-74080201-12
Included in Proceedings of the U.S.-Japan Meeting on Aquaculture (1st) Held at Tokyo, Japan on October 18-19, 1971 under the Sponsorship of the U.S.-Japan Cooperative Program in Natural Resources (UJNR), p97-101 Feb 74, COM-74-50849.

Descriptors: *Algae, *Aquaculture, Aquatic plants, Sea grasses, Pollution, Bays(Topographic features), Estuaries, Manpower, Operating costs, Prices, Japan.
Identifiers: Porphyra yezoensis, Porphyra pseudolinearis, Porphyra tenera.

Although the Japanese are still encountering many problems in optimizing the culture of the several species of marine algae, they are able to produce nearly as much as they need. Their real problems of the future appear to lie in the fields of (1) undesirable pollution; (2) oversupply with its resultant lowering of price, and (3) idealizing the labor situation (improved working conditions, keeping wages and profits in line with other industries in Japan, keeping sufficient workers in the industry and finding acceptable employment for any excess over that which is needed, etc.). Many of the techniques developed in Japan could be used by U.S. industry, but our labor costs are already so high that nearly all seaweed farming in the United States would have to be essentially totally mechanized.

N74-29724/3GA PC$5.25/MF$2.25
Delaware Univ., Newark.
DYNAMICS OF PLANKTON POPULATIONS IN UPWELLING AREAS.
Final Report.
K. H. Szekielda. 1974, 45p NASA-CR-139042
Contract NAS5-21784

Descriptors: *Plankton, *Remote sensors, *Upwelling water, Africa, Climatology, Oceanography, Satellite-borne instruments, Thermoclines.

For abstract, see STAR 1219

8B. Cartography

AD-785 698/2GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
AUTOMATED SELECTION AND LOCATION OF TERRAIN FEATURES ON THE BASIS OF SPECTRAL CHARACTERISTICS,
Albert N. Williamson, Jr. 26 Aug 74, 16p

Descriptors: *Terrain intelligence, *Multiband spectral reconnaissance, *Scientific satellites, *Spectrophotometers, Spectrum signatures, Detectors, Telemeter systems, Data processing, Maps, Photogrammetry.
Identifiers: ERTS-1 satellite, Multispectral scanners, Computer aided analysis.

The report details data processing methods for converting multispectral scanner images, transmitted from a satellite, by application of computer techniques.

AD-785 727/9GA PC$7.00/MF$2.25
Virginia Univ Charlottesville Research Labs for the Engineering Sciences
THE APPLICATION OF IMAGE SENSING ARRAYS TO METROLOGY, DETECTION AND MAPPING.
Final rept.,
Eugene S. McVey, Edward A. Parrish, Jr., and Gerald Cook. Jun 74, 192p Rept no. EE-3317-107-74-U ETL-CR-74-9
Contract DAAK02-72-C-0090
See also report dated Apr 73, AD-761 121.

Descriptors: *Mapping, *Optical images, *Metrology, Photogrammetry, Data processing, Pattern recognition, Photointerpretation, Television cameras, Perturbation theory, Computer programs, Detectors, Position finding, Aerial photographs, Image processing, Light emitting diodes, Optical filters.
Identifiers: Optical data processing, Edge detection, Computer aided mapping.

This report covers the fourth year of a research effort devoted to the study of the application of image sensing arrays and related problems. Recent progress is reported in the areas of signal perturbation for edge detection and picture printing via LED's, optical data acquisition, use of Kalman filtering and smoothing for data resolution enhancement, and reseaux detection using spatial filtering techniques. It is intended that results of this effort will ultimately be applied to map processing and to other related areas. (Author)

AD-785 793/1GA Reprint
Northwestern Univ Evanston Ill Dept of Geological Sciences
SCALAR AND DIRECTIONAL FIELD AND ANALYTICAL DATA FOR SPATIAL VARIABILITY STUDIES,
E. H. Timothy Whitten. 19 Sep 73, 18p AROD-9894.6-EN
Grant DA-ARO-D-31-124-72-G54
Presented at the NATO Advanced Study Inst. on the Display and Analysis of Spatial Data held at Nottingham (England) in Jul 73.
Availability: Pub. in Mathematical Geology, v6 n2 p183-198 1974.

Descriptors: *Mapping, Sequential analysis, Hypotheses.

Maps are used primarily as inventories or to evaluate spatial variability as a means of testing hypotheses. Sequential steps involved in evaluating relevant variables and in testing hypotheses about specified target populations are outlined. Identification of component subproblems and attempts to use the formalism necessary iteratively to test deterministic differential equations (or the corresponding probabilistic equations) could enhance the understanding of many earth-science problems. (Author)

AD-785 838/4GA PC$4.25/MF$2.25
Defense Mapping Agency Aerospace Center St Louis Air Force Station Mo
FULLY AUTOMATED COMPILATION OF GRAVITY AND GEOPHYSICAL MAPS.
Technical paper,
Luman E. Wilcox, Joe M. Estes, and Walter Czarnecki. Sep 74, 67p* Rept no. DMAAC-TP-74-002

Descriptors: *Maps, *Data processing, Gravity, Automation, Computer applications, Plotting, Predictions, Geophysics.
Identifiers: *Gravity anomaly maps.

A wide variety of gravity and geophysical maps can be produced by fully automated methods. The locations of gravity measurements, gravity anomaly values, gravity anomaly contours, continental outlines, title, legend, labels, and other data to be shown on the maps are computer generated, then drawn by automatic plotting equipment. This procedure is used to prepare charts showing the density and distribution of gravity data holdings, contoured gravity anomaly maps and other graphics needed for gravity data evaluation and mean anomaly prediction purposes, maps of gravity station elevations used as vertical control in topographic map compilation, and maps of glacial ice thickness for geophysical analysis. (Modified author abstract)

AD-785 877/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
WORK DEALING WITH DENSIFICATION OF ALTIMETRIC-PLANOMETRIC DATA POINTS EMPLOYING UNIVERSAL INSTRUMENTS AND RADIO ALTIMETER AND STATOSCOPIC INDICATIONS,
N. L. Borodin. 25 Jul 74, 13p Rept no. FSTC-HT-23-780-72
Trans. of Geodiziya i Kartografiya (USSR) n11 p46-52 1969.

Descriptors: *Photogrammetry, Aerial photography, Radio altimeters, Translations, USSR.

AD-785 932/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
MORPHOGRAPHIC AND MORPHOMETRIC ANALYSIS OF VEGETATIVE COVER PHOTOGRAPHS IN AERIAL PHOTOGRAPHY FOR THE MAPPING OF VEGETATION,
B. V. Vinogradov. 1 Nov 73, 11p Rept no. FSTC-HT-23-1296-73
Trans. of mono. Krupnomasshtabnoe Kartografirovanie Rastitelnosti, Novosibirsk, 1970 p96-101, by Markowitz.

Descriptors: *Aerial photography, *Mapping, Vegetation, Landforms, Classification, USSR, Translations.

Countour boundaries and transition areas provide the greatest amount of information to the eye in the interpretation of photo images; this principle can be applied to the mapping of vegetation by aerial photography. The article discusses a variety of morphographic landform classifications, their relation to geobotanical interpretation, and means and methods for gathering and processing statistical information from aerial photographs. The value of statistical methods in simplifying field work is stressed.

AD-785 936/6GA PC$3.75/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THEORY OF WIDE-ANGLE PHOTOGRAPHIC PROCESSING,
G. B. Gonin. 19 Feb 74, 29p Rept no. FSTC-HT-23-1287-73

Trans. of unidentified Russian language mono., Leningrad, 1967 p121-135.

Descriptors: *Photogrammetry, *Panoramic photographs, Wide angles, Translations, USSR.

The article deals with the development of a general theory for the processing and interpretation of the kind of wide-angle (panoramic) photographs which might be taken by a stationary camera system on the surface of a celestial body. The overall distinguishing feature of the photogrammetric method considered is a transition to equivalent planar pictures of central projection.

E74-10687 PC$4.25/MF$2.25
Honeywell, Inc., Minneapolis, Minn. Systems and Research Div.
AUTOMATIC PHOTOINTERPRETATION FOR LAND USE MANAGEMENT IN MINNESOTA.
Final rept.,
G. D. Swanlund, L. Kirvida, M. Cheung, D. Pile, and R. Zirkle. 21 Jun 74, 65p NASA-CR-139220
Contract NAS5-21742
Original contains color illustrations.

Descriptors: Photointerpretation, Land use, Minnesota, Land management, Earth resources program, Thematic mapping, Multispectral photography, Data processing.

The author has identified the following significant results. Automatic photointerpretation techniques were used to evaluate the feasibility of data for land use management. It was shown that ERTS-1 MSS data can produce maps of adequate resolution and accuracy to update land use maps. In particular, five typical land use areas were mapped with classification accuracies ranging from 77% to over 90%.

E74-10734 PC$3.25/MF$2.25
Sheffield Univ. (England). Dept. of Geography.
STEREO STUDY AS AN AID TO VISUAL ANALYSIS OF ERTS AND SKYLAB IMAGES,
J. L. vanGenderen. Nov 73, 10p NASA-CR-139624

Descriptors: Stereophotography, Photointerpretation, Multispectral photography, Imaging techniques, Skylab program, EREP, Earth resources program, Signal to noise ratios.

The author has identified the following significant results. The parallax on ERTS and Skylab images is sufficiently large for exploitation by human photointerpreters. The ability to view the imagery stereoscopically reduces the signal-to-noise ratio. Stereoscopic examination of orbital data can contribute to studies of spatial, spectral, and temporal variations on the imagery. The combination of true stereo parallax, plus shadow parallax offer many possibilities to human interpreters for making meaningful analyses of orbital imagery.

N74-29726/8GA PC$4.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
A SYSTEM OF CONDITIONAL RELIEF SYMBOLS FOR LUNAR TOPOGRAPHIC MAPS.
K. B. Shingareva, and G. A. Burba. Jul 74, 28p
NASA-TT-F-15676, REPT-152
Contract NASW-2483
Tran-Transl. Into English of "Sistema Uslovnykh Znakov Relyefa Dlya Lunnykh Topograficheskikh Planov", Acad. Of Sci. Ussr, Moscow, Report, No. 152, 26 p.

Descriptors: *Lunar maps, *Lunar topography, *Relief maps, Lunik lunar probes, Mapping, Surveyor lunar probes.

For abstract, see STAR 1219

N74-29728/4GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
GLOBAL DETAILED GEOID COMPUTATION AND MODEL ANALYSIS.
J. G. Marsh, and S. Vincent. Mar 74, 52p NASA-TM-X-70709, X-921-74-131
Subm-Submitted for Publication.

Descriptors: *Abnormalities, *Geoids, *Gravitation, Atmospheric models, Gravimetry.

For abstract, see STAR 1219

N74-29733/4GA PC$8.75/MF$2.25
Arizona Univ., Tucson. Office of Arid Lands Studies.
APPLICATION OF REMOTE SENSING TO STATE AND LOCAL GOVERNMENT (ARSIG).
Annual Report.
K. E. Foster, and J. D. Johnson. Apr 74, 113p
NASA-CR-139315, AR-2
Contract NGL-03-002-313
Misc-Original Contains Color Illustrations.

Descriptors: *Arizona, *Remote sensors, *Technology utilization, Earth resources, Geothermal resources, Hydrology, Land management, Side-looking radar.

For abstract, see STAR 1219

8C. Dynamic Oceanography

AD-785 716/2GA Reprint
Louisiana State Univ Baton Rouge Coastal Studies Inst
ON THE LOG-LINEAR WIND PROFILE AND THE RELATIONSHIP BETWEEN SHEAR STRESS AND STABILITY CHARACTERISTICS OVER THE SEA.
Technical rept.,
Shih-Ang Hsu. Dec 74, 10p Rept no. TR-168
Contract N00014-69-A-0211-0003
Availability: Pub. in Boundary-Layer Meteorology, v6 n3/4 p509-514 May/Jun 74.

Descriptors: *Air water interactions, Shear stresses, Stability, Wind, Ocean surface.
Identifiers: Atmospheric boundary layer.

Wind and stability characteristics in the atmospheric surface boundary layer at a height, Z, less than 20 m above the sea were examined in nine oceanic investigations. The analysis lends further support to the utility of the log-linear wind-profile law. (Modified author abstract)

AD-786 154/5GA Reprint
Institute for Acoustical Research Miami Fla
THE EFFECTS OF TILT ON A SAVONIUS ROTOR EXPOSED TO A TURBULENT FLOW REGIME,
Morton Kronengold, and Howard Charles Serkin. 11 Feb 74, 19p Rept no. IAR-74002
Contract N00014-73-C-0014
Prepared in cooperation with Harvard Univ., Cambridge, Mass. Revision of report dated 5 Nov 73.
Availability: Pub. in IEEE Transactions on Geoscience Electronics, vGE12 n2 p55-69 Apr 74.

Descriptors: *Flowmeters, *Florida Strait, Performance(Engineering), Ocean currents, Velocity, Errors, Tilt, Housings(Enclosures), Calibration, Turbulent flow, Oceanographic equipment.
Identifiers: Savonius rotor current meters.

Results are presented of measurements of the performance of Savonius rotor type instrumentation being used for high resolution current profile studies in the Straits of Florida. The instrumentation housing is designed to hold the rotor horizontally during a profile measurement of the water column, but internal and external forces act to displace the profilers from their designed horizontal axis and introduce errors into their measurement of current velocity. The necessity for determining the occurrence and magnitude of these errors prompted this investigation into the effects of tilt on a Savonius rotor exposed to a turbulent flow regime, plus the development of an instrument to measure rotor inclination. (Modified author abstract)

AD-786 237/8GA PC$4.75/MF$2.25
Williams Coll Williamstown Mass
BEACH PROCESSES ON THE OREGON COAST, JUL 1973.
Technical rept.,
William T. Fox, and Richard A. Davis, Jr. 30 Aug 74, 89p Rept no. WC-12
Contract N00014-69-C-0151
See also report dated 3 Apr 73, AD-760 348. Prepared in cooperation with University of South Florida, Tampa.

Descriptors: *Beach erosion, *Ocean waves, *Oregon, Time series analysis, Sand, Wind, Upwelling, Fog, Ocean currents, Tides, Morphology, Topography, Coastal regions, Basalt.
Identifiers: Rip currents, Sand bars.

During July and August, 1973, a 45-day time-series study was undertaken on the central Oregon coast to relate weather and wave conditions to beach erosion and sand bar migration. The summer weather pattern was dominated by the East-Pacific subtropical high which produced winds and waves from the northwest and extended periods of upwelling and coastal fog. When low pressure systems moved through, wind and waves shifted to the southwest. Three beaches were mapped at low tide to show changes in beach and bar morphology through time. At South Beach, Oregon two sets of bars with intervening rip channels advanced shoreward at 1 to 5 meters/day and southward at 10 to 15 meters/day. At Beverly Beach, Oregon, a basalt ridge 700 meters offshore resulted in wave diffraction and sand deposition in the central portion of the beach. A rip channel at the south end of the beach moved 300 meters to the south. At Gleneden Beach, cusps 40 meters long were cut into the steep foreshore. (Modified author abstract)

COM-74-11543/7GA Reprint
Scripps Institution of Oceanography, La Jolla, Calif.
ATOLL PERMEABILITY CALCULATED FROM TIDAL DIFFUSION,
Ronald K. Lam. 10 Apr 74, 11p NOAA-74082204
Grant NOAA-2-35208
Revision of report dated 29 Oct 73.
Pub. in Jnl. of Geophysical Research, v79 n21 p3073-3081, 20 Jul 74,

Descriptors: *Atolls, *Tides, Permeability, Ground water, Mathematical models, Diffusion, Swains Island.
Identifiers: Sea Grant program.

A method is presented for calculating the average subsurface permeability of an atoll from surface measurements of ground water tides. Tide measurements of about 1-month duration were taken on Swains Island, and atoll located in the southern Tokelau group. Records were obtained for the ocean, the lagoon, and eight wells on land. These measurements were compared with numerical models to predict subsurface permeability.

COM-74-11547/8GA PC$3.25/MF$2.25
National Oceanographic Instrumentation Center, Washington, D.C.
MODELS RCM-4 AND RCM-5, AANDERAA RECORDING CURRENT METERS. IVAR AANDERAA, HARDANGEVEREN 2, 5050 NESTUN, NORWAY.
Instrument fact sheet.
Jul 74, 18p IFS-75002 NOAA-74090606

Descriptors: *Ocean currents, *Flowmeters, Instrument characteristics, Design, Velocity measurement, Temperature measurement, Sampling, Performance evaluation, Specifications, Magnetic compasses.

Aanderaa Recording Current Meters Models RCM-4 and RCM-5 are self-contained instruments designed to measure and record water current speed, direction, and temperature in accordance with a preprogramed sampling scheme and include optional features for measuring and recording seawater conductivity and depth (pressure). The former is designed for a depth capability of 2,000 meters; the design figure for the latter is 5,000 meters. Current speed is sensed by a Savonius-like rotor that drives a potentiometer via a magnetically coupled follower and gearbox. Current direction is sensed with a vane and fluid-damped magnetic compass.

COM-74-11558/5GA PC$4.75/MF$2.25
University of Southern California, Los Angeles. Allan Hancock Foundation.
MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART VI. CIRCULATION INVESTIGATIONS. CURRENT MEASUREMENTS IN THE OUTER LOS ANGELES HARBOR,
Kendal Robinson, and HaroldPorath. Jul 74, 95p
USC-SG-7-74 NOAA-74082004

Descriptors: *Ocean currents, *Los Angeles Harbor, *Water pollution, Tides, Flowmeters, Wind(Meteorology), Velocity measurement, San Pedro Bay, California.
Identifiers: Sea Grant program.

Surface currents in the Los Angeles Harbor were measured by three current meters. The main current producing forces appear to be tide and wind with the resulting current modified by the geometry of the basin. Current speeds were generally 0.1 to 0.2 knots at the surface and were more variable at stations near the outer breakwater than at stations near Terminal Island. A large counter-clockwise gyre was found during one period of observation, followed by a period of divergence in the same area one week later.

COM-74-50935/7GA MF$2.25
National Ocean Survey, Rockville, Md.
TIDE TABLES. HIGH AND LOW WATER PREDICTIONS 1975. EAST COAST OF NORTH AND SOUTH AMERICA INCLUDING GREENLAND.
1974, 292p NOAA-74082602
Paper copy available from National Ocean Survey, Rockville, Md. 20852. $2.00.

Descriptors: *Ocean tides, Predictions, Seal level, Tables(Data), Ports, Oceanographic data, Ephemerides, Elevation, Greenland, North America, South America, Coasts.
Identifiers: Moonrise, Moonset.

The edition of the Tide Tables, East Coast of North and South America contains full daily predictions for 48 reference ports and differences and other constants for about 2,000 stations in North and South America. It contains also a table for obtaining the approximate height of the tide at any time, a table of local mean time of sunrise and sunset for every 5th day of the year for different latitudes, a table for the reduction of local mean time of standard time, a table of moonrise and moonset for 8 places, and a table of the Greenwich mean time of the moon's phases, apogee, perigee, greatest north and south and zero declination, and the time of the solar equinoxes and solstices.

E74-10747 PC$3.25/MF$2.25
Delaware Univ., Newark. Coll. of Marine Studies.
TRACKING AIR-DROPPED DROGUES AND DYES FROM AIRCRAFT IN SUPPORT OF ERTS-1 CIRCULATION STUDIES,
V. Klemas, and G. Davis. 16 Sep 74, 2p NASA-CR-139987
Contract NAS5-21837

Descriptors: Delaware, Water circulation, Dyes, Towed bodies, Water currents, Earth resources program, Mapping, Tides, Water flow, Water depth.

The author has identified the following significant results. For two years ERTS-1 has been employed to investigate current circulation patterns in Delaware Bay under different tidal, flow, and wind conditions. Since sufficient numbers of current meters and boats are not available, air-droppable drogues and dye packs have been developed and tested. The drogues consist of a styrofoam float and a line to which is attached a stainless steel biplane. The length of the line determines at what depth currents will be monitored. The floats are color coded to distinguish their movement and mark the depth of the biplanes. Simultaneously floating and anchored dye packs of fluorescein dye have been deployed from aircraft. The movement of the dye and drogues is tracked by sequential aerial photography, using fixed markers on shore or on buoys as reference points to calibrated the scale and direction of drogue movement. The current data obtained by this technique is then used to annotate current circulation maps derived from ERTS-1 imagery.

N74-29706/0GA PC$15.75/MF$2.25
Technische Hogeschool, Delft (Netherlands).
COMPUTATION OF SET-UP, LONGSHORE CURRENTS, RUN-UP AND OVERTOPPING DUE TO WIND-GENERATED WAVES.
Ph.D. Thesis.
J. A. Battjes. 5 Jun 74, 251p

Descriptors: *Air water interactions, *Coastal currents, *Hydrodynamics, *Waterwave energy, Beaches, Computation, Equations, Sine waves, Slopes, Stochastic processes.

For abstract, see STAR 1219

N74-29708/6GA PC$9.00/MF$2.25
La Plata Univ. (Argentina).
ANALYSIS OF TIDAL RECORDS. ABSOLUTE FILTERING METHOD.
J. Mateo. 1974, 118p

Descriptors: *Argentina, *Numerical analysis, *Tides, *Water waves, Filters, Graphs (Charts), Mathematical models.

For abstract, see STAR 1219

N74-30836/2GA PC$5.25/MF$2.25
Research Triangle Inst., Research Triangle Park, N.C.
ENGINEERING STUDIES RELATED TO GEODETIC AND OCEANOGRAPHIC REMOTE SENSING USING SHORT PULSED TECHNIQUES.
Final Engineering Report for Task D.
May 73, 44p NASA-CR-137464
Contract NAS6-2135
Subm-Prepared by North Carolina State Univ.

Descriptors: *Geodesy, *Oceanography, *Remote sensors, Lasers, Ocean currents, Surface properties.

For abstract, see STAR 1220

N74-30842/0GA PC$12.25/MF$2.25
Applied Science Associates, Inc., Apex, N.C.
OCEAN DYNAMICS STUDIES.
Final Report.
May 74, 185p NASA-CR-137467
Contract NAS6-2307

Descriptors: *Ocean currents, *Water waves, Capillary waves, Feasibility analysis, Ocean surface, Remote sensors, Statistical analysis, Surface waves.

For abstract, see STAR 1220

8E. Geodesy

AD-785 843/4GA PC$4.25/MF$2.25
Naval Weapons Lab Dahlgren Va
PRACTICAL REALIZATION OF A REFERENCE SYSTEM FOR EARTH DYNAMICS BY SATELLITE METHODS.
Technical rept.,
Richard J. Anderle, and Mark G. Tanenbaum. Aug 74, 51p Rept no. NWL-TR-3161

Descriptors: *Geodesics, *Satellites(Artificial), Coordinates, Accuracy, Tides, Motion, Polar regions, Earth crust, Lasers, Corrections, Gravity, Drag.
Identifiers: LAGEOS satellite.

Observations of artifical earth satellites provide a means of establishing an origin, orientation, scale and control points for a coordinate system. Neither existing data nor future data are likely to provide significant information on the .001" angle provided data to about .01" accuracy on the pole position and to possibly a meter on the origin of the system and for control points. The longitude origin is essentially arbitrary. While these accuracies permit acquisition of useful data on tides and polar motion through dynamic analyses, they are inadequate for determination of crustal motion or significant improvement in polar motion. The limitations arise from gravity, drag and radiation forces on the satellites as well as from instrument errors. Improvements in laser equipment and the launch of the dense LAGEOS satellite in an orbit high enough to suppress significant gravity and drag errors will permit determination of crustal motion and more accurate, higher frequency, polar motion. (Modified author abstract)

AD-785 869/9GA PC$3.75/MF$2.25
Center for Naval Analyses Arlington Va Naval Warfare Analysis Group
THE GLOBALL COMPUTER PROGRAM AND GLOBEMAP - A SPECIAL PURPOSE THREE-DIMENSIONAL PLOTTER SUBROUTINE.
Lewis W. Linton. Jul 74, 45p Rept no. NWAG-Research Contrib-266
Contract N00014-68-A-0091

Descriptors: *Geodesy, *Computer programs, Computations, Plotters.
Identifiers: GLOBALL computer program, GLOBEMAP subroutine.

GLOBALL manipulates several smaller computer programs to calculate global ranges and surface areas. GLOBEMAP provides a three-dimensional map background upon which the ranges and areas may be presented. This paper is not intended to be a user's manual but to describe characteristics of these models and possible applications of them. (Author)

AD-785 882/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THE NEXT PROBLEMS IN THE AREA OF THE IMPLEMENTATION OF PLANNING FOR CARTOGRAPHICAL-GEODETIC WORK,
L. A. Kashin. 21 Feb 74, 11p Rept no. FSTC-HT-23-1558-73
Trans. of Geodeziya i Kartografiya (USSR) n7 p1-5 1972.

Descriptors: *Geodesics, *Mapping, *Topography, Translations, USSR, Production, Production rate, Planning, Economics.

Geodesy and cartography in the Sovet Union are discussed. A brief history of the improvements and changes over the past few years is given.

AD-785 886/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
INVESTIGATION OF ACCURACY OF DETERMINATION OF PLANE COORDINATES BY MEANS OF THE CENTRAL SCIENTIFIC RESEARCH INSTITUTE OF GEODESY, AERI-

AL PHOTOGRAPHY AND CARTOGRAPHY AIRBORNE RANGEFINDER,
I. L. Gill, K. N. Gertsenova, and B. A. Batamanovskii. 19 Nov 73, 12p Rept no. FSTC-HT-23-1270-73
Trans. of Geodeziya i Kartografiya (USSR) n3 p37-44 1972.

Descriptors: *Aerial photography, *Topographic maps, Translations, USSR, Mapping, Photogrammetry, Experimental data.

To answer the question of the possibility of using an airborne range finder (ARR) in topographic surveys on a 1:10,000 scale, and to choose the optimum technology of operations, experimental investigations were carried out on the accuracy of creating a radio-geodetic plane base by a method using the ARR.

AD-785 998/6GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
SCIENTIFIC RESEARCH AND EXPERIMENTAL DESIGN PLANNING AND COORDINATION FOR 1973,
A. E. Sitalov. 15 Apr 74, 7p Rept no. FSTC-HT-23-0158-74
Trans. of Geodeziya i Kartografiya (USSR) n2 p72-74 Feb 73.

Descriptors: *Research management, *Geodesy, *Mapping, *Aerial photography, Planning, Translations, USSR.

The report gives the results of a meeting discussing coordination of plans and projects in geodesy, aerial photography and cartography. New techniques, instruments and cooperation are introduced for 1973 to increase the efficiency of work done by the geodetic service. The topographical, geodetic and cartographic services are now part of the Scientific and Technical Mining Society.

N74-29732/6GA PC$8.00/MF$2.25
Ohio State Univ. Research Foundation, Columbus. Dept. of Geodetic Science.
BASIC RESEARCH AND DATA ANALYSIS FOR THE NATIONAL GEODETIC SATELLITE PROGRAM AND FOR THE EARTH AND OCEAN PHYSICS APPLICATIONS PROGRAM.
Semiannual Status Reports, Jan. - Jun. 1974.
Jul 74, 99p NASA-CR-139249, SASR-14
Contracts NGL-36-008-093, NGR-36-008-204

Descriptors: *Geodetic satellites, *Lageos (Satellite), *Oceanography, Data acquisition, Earth rotation, Ephemerides, Geodetic coordinates, Tracking networks, Tracking stations, University program.

For abstract, see STAR 1219

N74-30704/2GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.
CERTAIN ASPECTS OF THE PROBLEM OF REDUCING THE FORCE OF GRAVITY.
S. V. Yevseyev. Jul 74, 11p NASA-TT-F-15839
Contract NASW-2485
Tran-Transl. Into English from Geofiz. Sb. (Ussr), V. 55, 1973 p 3-8.

Descriptors: *Gravity anomalies, *Topography, Geodesy, Gravitational fields, Isostasy, Least squares method, Mathematical models, U.s.s.r..

For abstract, see STAR 1220

N74-30831/3GA PC$8.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
DETERMINATION OF GRAVITY CONSTANTS AND MEASUREMENT OF CERTAIN FINE GRAVITY EFFECTS.
Y. D. Boulanger, and M. U. Sagitov. Jul 74, 101p NASA-TT-F-15722
Contract NASW-2481
Tran-Transl. Into English of the Book "Operedeleniye Postoyannoy Tyagoteniya I Izmereniye Nekotorykh Tonkikh Gravitatsionnykh Effektov" Moscow, Nauka Press, 1973 67 p.

Descriptors: *Antennas, *Gravitational effects, Gravitational constant, Sensitivity, Vibration.

For abstract, see STAR 1220

8F. Geography

DUN-1410 PC$16.00/MF$2.25
Douglas United Nuclear, Inc., Spokane, Wash.
GEOLOGY AND TECTONIC HISTORY OF THE HANFORD AREA AND ITS RELATION TO THE GEOLOGY AND TECTONIC HISTORY OF THE STATE OF WASHINGTON AND THE ACTIVE SEISMIC ZONES OF WESTERN WASHINGTON AND WESTERN MONTANA.
F. E. Jones, and R. J. Deacon. 15 Jun 66, 258p

Descriptors: (*Hapo, *Geology), (*Washington, Geology), Geologic deposits, Maps, Seismic effects, Tectonics.

For abstract, see NSA 30 08, number 21174.

E74-10745 PC$3.25/MF$2.25
Delaware Univ., Newark. Coll. of Marine Studies.
SKYLAB AND ERTS-1 INVESTIGATIONS OF COASTAL LAND USE AND WATER PROPERTIES,
V. Klemas, D. Bartlett, and R. Rogers. 17 Sep 74, 2p NASA-CR-139985
Contracts NAS5-21837, NAS1-12304
Prepared in cooperation with the Bendix Corp., Ann Arbor, Mich.

Descriptors: Coastal water, Land use, Estuaries, Continental shelves, Delaware, Water pollution, EREP, Skylab program, Earth resources program, Vegetation, Multispectral photography, Photomapping.

The author has identified the following significant results. ERTS-1 multispectral scanner and Skylab's S190A, S190B, and S192 data products were evaluated for their utility in studying current circulation, suspended sediment concentrations and pollution dispersal in Delaware Bay and in mapping coastal vegetation and land use. Imagery from the ERTS-1 MSS, S190A and S190B cameras shows considerable detail in water structure, circulation, suspended sediment distribution and within waste disposal plumes in shelf waters. These data products were also used in differentiating and mapping twelve coastal vegetation and land use classes. The spatial resolution of the S190A multispectral facility appears to be about 30 to 70 meters while that of the S190B earth terrain camera is about 10 to 30 meters. Such resolution, along with good cartographic quality, indicates a considerable potential for mapping coastal land use and monitoring water properties in estuaries and on the continental shelf. The ERTS-1 MSS has a resolution of about 70-100 meters. Moreover, its regular 18-day cycle permits observation of important changes, including the environmental impact of coastal zone development on coastal vegetation and ecology.

E74-10755 PC$3.25/MF$2.25
Dartmouth Coll., Hanover, N.H. Dept. of Earth Sciences.
SKYLAB IMAGERY OF CENTRAL AMERICAN VOLCANOES.
Progress rept. Feb-Apr 74,
Richard E. Stoiber, and William I. Rose, Jr. Aug 74, 4p NASA-CR-139995
Contract NAS9-13311
Prepared in cooperation with Michigan Technological Univ., Houghton.

Descriptors: Volcanology, El Salvador, Guatemala, EREP, Skylab program, Multispectral photography, Thermal radiation.

The author has identified the following significant results. The size and intensity of the Izalco volcano thermal anomaly, which were increasing between July and December 1973, have not increased in the January-April 1974 period. Volcanic activity at Pacaya volcano, Guatemala was very prominent during the quarter. Details of the activity are being collected and assembled.

E74-10760 PC$4.25/MF$2.25
Imperial Government of Iran, Tehran.
AN EVALUATION OF THE UTILITY OF ERTS-1 DATA FOR MAPPING AND DEVELOPING NATURAL RESOURCES OF IRAN.
Interim rept. Jan-Jun 73,
K. Ebtehadj. Jul 73, 71p NASA-CR-140000
Original contains color illustrations. Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Iran, Land use, Resources management, Photomapping, Earth resources program, Geology, Hydrology, Agriculture, Forests, Rangelands, Marine environments.

The author has identified the following significant results. Significant results are reported in the creation of an Iranian photomosaic from ERTS-1 imagery; in tectonic and structural mapping and interpretation, including discovery of significant new fault patterns in Iran; in river and lake mapping; in wetlands and fisheries nursery delineation and mapping; in range and agricultural surveys and inventories using multi-stage sample methods; and in the computer analysis of ERTS-1 digital tapes for urban land use.

LA-5608-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
NUMERICAL SOLUTION OF MELT FLOW AND THERMAL ENERGY TRANSFER FOR THE LITHOTHERMODYNAMICS OF A ROCK-MELTING PENETRATOR.
R. D. McFarland. May 74, 20p
Contract W-7405-eng-36

Descriptors: (*Rocks, *Melting), (*Subterrene penetrators, *Performance), Axial symmetry, Energy transfer, Finite difference method, Fluid flow, Geometry, Hydrodynamics, Layers, Numerical solution, Soils, Thermodynamic properties.

For abstract, see NSA 30 08, number 20929.

N74-29544/5GA PC$4.50/MF$2.25
Illinois Univ., Urbana. Center for Advanced Computation.
IMPLEMENTATION OF ILLIAC 4 ALGORITHMS FOR MULTISPECTRAL IMAGE INTERPRETATION.
Final Report, Mar. 1973 - Feb. 1974.
R. M. Ray, J. D. Thomas, W. E. Donovan, and P. H. Swain. Jun 74, 26p NASA-CR-139214, CAC-112
Contracts NGR-14-005-202, DAHCO4-75-C-0001

Descriptors: *Algorithms, *Earth resources, *Illiac 4 computer, *Multispectral photography, *Photointerpretation, Cost effectiveness, Data processing, Earth resources program.

For abstract, see STAR 1219

N74-29711/0GA PC$5.00/MF$2.25
Oregon State Univ., Corvallis.
SECOND-YEAR PROJECTS AND ACTIVITIES OF THE ENVIRONMENTAL REMOTE SENSING APPLICATIONS LABORATORY (ERSAL).
Annual Progress Report, 1 Apr. 1973 - 31 Mar. 1974.
D. A. Mouat, and B. J. Schrumpf. 31 Mar 74, 39p NASA-CR-139380
Contract NGL-38-002-053

Descriptors: *Remote sensors, *Technology utilization, Earth resources, Environment protection, Land use, Oregon, University program.

For abstract, see STAR 1219

N74-30699/4GA PC$4.75/MF$2.25
Tohoku Univ., Sendai (Japan).
THE SCIENCE REPORTS OF THE TOHOKU UNIVERSITY. SERIES 5: GEOPHYSICS, VOLUME 21, NO. 3.
Sep 73, 34p

Descriptors: *Geophysics, *University program, Japan, Reports, Science, Universities.

For abstract, see STAR 1220

N74-30835/4GA PC$5.00/MF$2.25
Long Island Univ., Greenvale, N.Y. Science Engineering Res. Group.
PHOTOGRAPHIC TECHNIQUES FOR ENHANCING ERTS MSS DATA FOR GEOLOGIC INFORMATION.
Final Report, Jan. 1973 - Mar. 1974.
E. Yost, W. Geluso, and R. Anderson. 1 Apr 74, 37p NASA-CR-139389, TR-23
Contract NGR-33-151-006
Misc-Original Contains Color Illustrations.

Descriptors: *Multispectral band scanners, *New mexico, *Satellite-borne photography, Earth resources technology satellites, Geology, Mapping.

For abstract, see STAR 1220

UCRL-51592 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
GEOLOGICAL AND SEISMOLOGICAL INVESTIGATION OF THE LAWRENCE LIVERMORE LABORATORY SITE.
L. H. Wight. 3 Jun 74, 43p
Contract W-7405-Eng-48

Descriptors: (*Lawrence livermore laboratory, *Geology), Earthquakes, Safety, Seismology.

For abstract, see NSA 30 08, number 21180.

USGS-474-145 PC$9.25/MF$2.25
Geological Survey, Denver, Colo.
RESULTS OF EXPLORATION OF BANEBERRY SITE, EARLY 1971.
Jul 74, 123p NTS-235
Contract AT(29-2)-474

Descriptors: (*Nevada test site, *Geology), (*Baneberry event, *Ground motion), Cavities, Deformation, Drill cores, Earth crust, Fractures, Gases, Mechanical effects, Openings.

For abstract, see NSA 30 08, number 21036.

USGS-474-174 PC$6.25/MF$2.25
Geological Survey, Denver, Colo.
STRAIN MEASUREMENT RESULTS FROM FOUR UNDERGROUND NUCLEAR EXPLOSIONS IN YUCCA AND FRENCHMAN FLATS, NEVADA.
D. D. Dickey, and J. H. Hassemer. Jun 74, 62p NTS-250
Contract AT(29-2)-474

Descriptors: (*Nevada test site, Earth crust), (*Earth crust, *Strains), (*Nuclear explosions, *Ground motion), Fractures, Mechanical effects, Strain gages, Stresses, Underground explosions.

For abstract, see NSA 30 08, number 21037.

8G. Geology and Mineralogy

AD-785 731/1GA Reprint
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
MAGNETIC LINEATIONS OBSERVED NEAR THE OCEAN FLOOR AND POSSIBLE IMPLICATIONS ON THE GEOMAGNETIC CHRONOLOGY OF THE GILBERT EPOCH,
K. D. Klitgord, J. D. Mudie, and W. R. Normark.
2 Nov 71, 17p Rept no. MPL-U-91/70
Contract N00014-69-A-0200-6002, Grant NSF-GA-31377
Prepared in cooperation with Minnesota Univ., Minneapolis. Dept. of Geology and Geophysics.
Availability: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v28 p35-48 1972.

Descriptors: *Magnetic anomalies, *Ocean bottom, Magnetic fields, Geologic age determination, Marine geophysics, Geologic formation, Magnetometers, Estimates, Pacific Ocean.
Identifiers: Geochronology, Ocean bottom spreading, Gilbert epoch.

Lineated magnetic anomalies, with a wavelength of 6 km and a peak-to-peak amplitude of 1500nT, were measured within 20 km of the continental crustal block of the tip of the Baja California peninsula of Mexico. The use of a high precision, local navigation system and measurements of the magnetic field close to the sea floor show that, at least in this small region, the sea floor spreading process has produced magnetic anomalies which are still lineated down to a scale of less than 1 km. These magnetic anomalies were formed during the younger part of the Gilbert Epoch of the geomagnetic time scale. They also indicate the absence of any previously undetected reversals of a duration of greater than 10,000 years. (Modified author abstract)

AD-785 879/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
DAMPING OF A WAVE PULSE WITH A SHORT ELASTIC ELEMENT,
O. D. Alimov. 25 Jul 74, 15p Rept no. FSTC-HT-23-182-73
Trans. of Politekhnicheskii Institut, Frunze. Trudy (USSR) n38 p82-91 1969.

Descriptors: *Rock, *Drilling, *Stress waves, Translations, USSR.

AD-786 108/1GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
CHANGE IN THE MAGNITUDE OF THE SEISMIC EFFECT OF QUARRY BLASTS AS A FUNCTION OF VARIOUS FACTORS,
G. V. Kuznetsov, and V. P. Ulybin. 11 Sep 74, 15p Rept no. FTD-HC-23-1569-74
Edited trans. of Vzryvnoe Delo (USSR) n71/28 p174-180 1972.

Descriptors: *Rock, *Blast, *Seismic waves, Acoustics, Vibration, Damping, Wave propagation, Translations, USSR.

Certain quantitative relationships between the displacement velocity and a series of indices have been obtained as a result of studies conducted by the Ural Scientific Research and Planning Institute of the Copper Industry in quarries of the Urals and Kazakhstan. Analysis of the experimental data shows that for the same values of reduced distance, the vibration velocity may change over very wide limits and depends chiefly on the properties of the rocks.

N74-29475/2GA PC$12.50/MF$2.25
California Univ., Berkeley. Space Sciences Lab.
ANALYTICAL TECHNIQUES FOR IDENTIFICATION AND STUDY OF ORGANIC MATTER IN RETURNED LUNAR SAMPLES.
Final Report, 1 Jun. 1966 - 31 May 1968.
A. L. Burlingame. 15 Mar 74, 186p NASA-CR-139367, SSL-SER-15-ISSUE-15
Contract NGR-05-003-134

Descriptors: *Chemical analysis, *Lunar rocks, *Organic materials, Bibliographies, Gas chromatography, Geochemistry, Lunar geology, Mass spectroscopy, Organic chemistry.

For abstract, see STAR 1219

N74-30832/1GA PC$4.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
GEOLOGICAL-PHYSIOGRAPHICAL EVALUATION OF ERTS IMAGES FROM AN AREA IN EASTERN BOLIVIA AND PARTS OF BRAZIL.
C. V. Flores. Aug 74, 6p NASA-TT-F-15857
Tran-Transl. Into English from the Spanish.

Descriptors: *Bolivia, *Brazil, *Earth resources technology satellite 1, *Geology, *Lithology, *Multispectral photography, Geomorphology, Photointerpretation, Stratigraphy.

For abstract, see STAR 1220

PB-235 464/5GA PC$4.25/MF$2.25
Illinois Univ., Urbana. Center for Advanced Computation.
LOW SULFUR COAL: A REVISION OF RESERVE AND SUPPLY ESTIMATES.
Research rept. (Final),
Michael Rieber. 30 Nov 73, 57p* UIUC-CAC-DN-73-88 NSF/RA/N-74-056
Grant NSF-GI-35821

Descriptors: *Coal deposits, Coal, Reserves, Natural resources, Availability, Materials estimates, Tables(Data).
Identifiers: *Low sulfur coal.

Conventionally, the definition of low sulfur coal, on which traditional reserve and supply estimates are based, depends only on the weight of sulfur in a ton of coal. The Btu content of the coal is not considered. Coal purchases and SO2 regulations are based on Btu content. A recalculation of reserve estimates of low sulfur coal on a utility average Btu basis reduces traditional U.S. estimates by over 75% and Western estimates by almost 85%. When calculated on a Btu basis, maximizing low sulfur coal production results in a supply shortage by 1985. Policy implications for an increased dependence on domestic coal and research needed on stack gas scrubbing, gasification, and liquefication are discussed.

TT-74-53013 PC$10.25/MF$2.25
Geological Survey, Reston, Va.
GEOCHEMISTRY, MINERALOGY AND METHODS OF DETERMINATION OF ELEMENTS OF THE PLATINUM GROUP,
O. E. Yushko-Zakharova, V. V. Ivanov, I. S. Razina, and L. A. Chernyaev. 1974, 394p
Trans. of mono. Geokhimiya, Mineralogiya, i Metody Opredeleniya Elementov Gruppy Platiny, Moscow, 1970 199p. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Platinum, *Geochemistry, *Mineralogy, Geology, Spectrochemical analysis, Chemical analysis, X ray diffraction, Electron microscopy, Translations, USSR.

Contents:
- Atomic structure and physico-chemical properties of the elements;
- Methods of determination of platinum elements and minerals;
- Minerals-carriers of traces of platinum metals;
- Distribution of the elements of platinum group in the rocks of the earth's crust;
- Platiniferous deposits associated with the rocks of gabbro-pyroxenite-dunite formation and similar massifs of ultrabasites;

Platinum deposits of other provinces resembling with the ural type;
Deposits of platinum bearing copper-nickel ores associated with gabbro-norite intrusives of stable regions;
The deposits of finno-Scandinavian shield;
Appearances of the metals of platinum group related with proper hydrothermal and metamorphogenic ore-deposits as with the ores of unexplained genesis;
Some geochemical characteristics of distribution of individual elements of platinum group;
Geochemical cycle of elements of platinum group.

UCID-15848 PC$5.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
PHYSICAL PROPERTIES OF (MOSTLY NORTHERN) YUCCA FLAT ALLUVIUM AND TUFF.
R. C. Carlson, and J. R. Hearst. 12 Jul 71, 36p
Contract W-7405-eng-48

Descriptors: (*Nevada test site, *Geology), (*Tuff, *Physical properties), (*Alluvial deposits, Physical properties), Boreholes, Density, Hydrology, Nuclear explosions, Seismology, Underground explosions.

For abstract, see NSA 30 08, number 21031.

UCID-16526 PC$4.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
SOME STUDIES OF DEEPLY BURIED HIGH EXPLOSIVE ROCK FRACTURING.
T. R. Butkovich. 20 Jun 74, 21p
Contract W-7405-eng-48

Descriptors: (*Rocks, *Fractures), Chemical explosions, Chemical explosives, Compression, Detonations, Excavation, Interfaces, Shock waves, Spallation, Underground, Wave propagation.

For abstract, see NSA 30 08, number 23487.

8H. Hydrology and Limnology

AD-785 616/4GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
FINITE ELEMENT ANALYSIS OF UNCONFINED FLOW WITH A VARIABLE TIME-STEP PROCEDURE.
C. S. Desai, and R. S. Sandhu. 1974, 15p

Descriptors: *Ground water, Porous materials, Partial differential equations, Numerical analysis.
Identifiers: Finite element analysis.

A finite element procedure for the general case of transient unconfined flow is described in this paper; other categories can be handled as special cases of the general case. Numerical characteristics of the proposed procedure are examined and a special scheme is developed that assures satisfaction of convergence and stability at each time level. The aspect of trade-offs in accuracy and computational effort in using approximating models of various orders for the fluid potential is also studied. The validity of the procedure is checked by comparing numerical predictions with laboratory and field observations for typical real life problems.

AD-785 772/5GA Reprint
Washington Univ St Louis Mo
EVOLUTION OF MEANDER LOOPS,
James C. Brice. 15 Oct 73, 8p AROD-8623.2-EN
Grant DA-ARO-D-31-124-70-G89
Revision of report dated 4 Jun 73.
Availability: Pub. in Geological Society of America Bulletin, v85 p581-586 Apr 74.

Descriptors: *Streams, *Geomorphology, Topographic maps.
Identifiers: *Meandering rivers.

The evolution of the meanders on reaches of 10 alluvial streams in the United States is reconstructed, and a scheme for the evolution and classification of meander loops, derived from a study of the meandering pattern of 125 alluvial streams, is proposed. (Modified author abstract)

AD-786 144/6GA PC$3.75/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
STUDY PLAN FOR AN ENVIRONMENTAL INVENTORY AND ASSESSMENT OF THE MISSISSIPPI RIVER 9-FT CHANNEL PROJECT BETWEEN ST. LOUIS, MISSOURI, AND CARIO, ILLINOIS.
Final rept.,
William P. Emge. Apr 72, 36p Rept no. AEWES-Misc-Paper-Y-72-3

Descriptors: *Environmental protection program, *Channels(Waterways), Aquatic animals, Floods, Swamps, Assessment, Ecology, Rivers, Recreation, Marine biology, Invertebrates, Biological products, Chemical properties, Hydrology, Illinois, Missouri.
Identifiers: Saint Louis(Missouri), Cario(Illinois), *Channel improvements, *Missouri River, *Flood plains, Benthos, Water pollution effects(Animals), Water pollution effects(Plants), Water pollution effects(Human).

The Mississippi River 9-ft channel project purpose is for obtaining and maintaining a 9- by 300-ft channel for navigation from the confluence of the Missouri River to the confluence of the Ohio River. An extensive terrestrial and aquatic inventory is required to establish a data base sufficient for biological analysis, and assessment of physical changes resulting from contraction efforts to obtain and maintain a 9-ft channel. A geomorphic model is required to determine the hydraulic response of the river to construction and extension of dikes. This study plan, organized and compiled by the U. S. Army Engineer Waterways Experiment Station, outlines procedures and techniques for an overall environmental inventory of the Mississippi River floodplain between St. Louis, Missouri, and Cairo, Illinois, and provides the framework for the assessment of data and analyses of relationships of the physical, biological, chemical, and cultural elements of the project area. (Modified author abstract)

AEC-tr-7570 PC$12.00/MF$2.25
USAEC Health and Safety Lab., New York.
USSR REPORTS ON NATURAL AND FALLOUT RADIOACTIVITY.
Jul 74, 179p
Translation of Russian articles.

Descriptors: (*Fallout, *Radiation monitoring), (*Natural radioactivity, Radiation monitoring), Environment, Leading abstract, Ussr.

For abstract, see NSA 30 08, number 21063.

BARC-719 PC$12.25/MF$2.25
Bhabha Atomic Research Centre, Bombay (India).
NATURAL RADIOACTIVITY AND GEOCHEMICAL PROCESSES IN THE MARINE ENVIRONMENT OF THE WEST COAST OF INDIA.
L. U. Joshi, and A. K. Ganguly. 1973, 183p
U.S. Sales Only.

Descriptors: (*India, *Natural radioactivity), (*Sediments, Natural radioactivity), (*Radium 228, *Radiation monitoring), (*Thorium isotopes, *Leaching), Coastal waters, Distribution, Isotope ratio, Protactinium 233, Radionuclide migration, Sampling, Shores, Uranium isotopes.

For abstract, see NSA 30 08, number 21107.

CH-1459 PC$6.25/MF$2.25
Chicago Univ., Ill.
REPORT FOR MONTH ENDING FEBRUARY 29, 1944.
3 Apr 44, 64p

Descriptors: (*Personnel, *Radiation monitoring), (*Laboratory animals, *Biological radiation effects), (*Plutonium, *Toxicity), (*Uranium, Toxicity), Environment, Testing, Barium 140, Beta sources, Cerium 140, External irradiation, Fast neutrons, Gamma sources, Internal irradiation, Lanthanum 140, Niobium 93, Radionuclide administration, Strontium 89, X radiation, Yttrium 86.

For abstract, see NSA 30 08, number 21064.

CN-1892 PC$4.00/MF$2.25
Chicago Univ., Ill.
STATUS OF PRODUCT MONITORING BY HEALTH PHYSICS SECTION.
H. M. Parker. Sep 44, 9p

Descriptors: (*Plutonium, *Maximum permissible intake), (*Environment, *Radiation monitoring), (*Personnel, Radiation monitoring), Alpha sources, Design, Personnel monitoring, Radiation monitors, Radioactivity, Surface contamination monitors.

For abstract, see NSA 30 08, number 21087.

CN-2238 PC$4.00/MF$2.25
Chicago Univ., Ill.
MONTHLY HEALTH REPORT ON PROBLEMS RELATING TO PRODUCT FOR PERIOD ENDING SEPTEMBER 31, 1944.
13 Oct 44, 7p

Descriptors: (*Plutonium, *Radiation monitoring), (*Environment, Radiation monitoring), (*Personnel, Radiation monitoring), (*Urine, *Radiometric analysis), Alpha sources, Personnel monitoring, Radioactivity, Sample preparation, Sampling, Autoradiography, Combustion, Inhalation, Injection, Lanthanum fluorides, Plutonium oxides, Radioactive aerosols, Radionuclide kinetics, Rats, Removal, Retention, Smokes, Testing, Tissue distribution, Toxicity.

For abstract, see NSA 30 08, number 21065.

CN-2786 PC$4.75/MF$2.25
Chicago Univ., Ill.
HEALTH PROBLEMS RELATING TO PRODUCT FOR MONTH OF MARCH 1945.
L. O. Jacobson. 12 Apr 45, 35p
Contract W-7401-eng-37

Descriptors: (*Plutonium, *Radiation monitoring), (*Environment, Radiation monitoring), (*Urine, *Radiometric analysis), Feces, Personnel dosimetry, Personnel monitoring, Sample preparation, Sampling, Autoradiography, Blood, Bone tissues, Chemical bonds, Citrates, Dogs, Excretion, Inhalation, Injection, Intratracheal administration, Mice, Plutonium nitrates, Plutonium oxides, Proteins, Rats, Retention, Smokes, Tissue distribution, Toxicity.

For abstract, see NSA 30 08, number 21066.

CN-2905 PC$4.50/MF$2.25
Chicago Univ., Ill.
MONTHLY HEALTH REPORT ON PROBLEMS RELATING TO PRODUCT FOR MONTH OF APRIL 1945.
9 May 45, 29p
Contract W-7401-eng-37

Descriptors: (*Plutonium, *Radiation monitoring), (*Environment, Radiation monitoring), (*Urine, *Radiometric analysis), Feces, Personnel dosimetry, Personnel monitoring, Sample preparation, Sampling, Comparative evaluations, Dogs,

Inhalation, Injection, Mice, Plutonium nitrates, Plutonium oxides, Radium, Rats, Smokes, Tissue distribution, Tissues, Toxicity.

For abstract, see NSA 30 08, number 21067.

CN-2992 PC$5.50/MF$2.25
Chicago Univ., Ill.
MONTHLY HEALTH REPORT ON PROBLEMS RELATING TO PRODUCT FOR MONTH OF MAY 1945.
E. S. G. Barron. 15 Jun 45, 48p
Contract W-7401-eng-37

Descriptors: (*Plutonium, *Radiation monitoring), (*Environment, Radiation monitoring), (*Personnel, Radiation monitoring), (*Urine, *Radiometric analysis), Alpha sources, Comparative evaluations, Feces, Inhalation, Injection, Mice, Pathological changes, Personnel monitoring, Radioactivity, Radionuclide kinetics, Radium, Rats, Retention, Sample preparation, Sampling, Tissue distribution, Toxicity.

For abstract, see NSA 30 08, number 21068.

CN-3167 PC$6.25/MF$2.25
Chicago Univ., Ill.
REPORT OF CONFERENCE ON PLUTONIUM, MAY 14TH AND 15TH.
J. J. Nickson. 23 Jul 45, 62p
Contract W-7405-eng-39

Descriptors: (*Plutonium, *Maximum permissible intake), (*Personnel, *Radiation protection), (*Environment, *Contamination), Biological effects, Data compilation, Maximum permissible concentration, Radioactivity, Radionuclide kinetics, Retention, Reviews, Safety standards, Standards, Tissue distribution, Toxicity.

For abstract, see NSA 30 08, number 21069.

CONF-731117-8 PC$4.00/MF$2.25
Scripps Institution of Oceanography, La Jolla, Calif.
EARLY SURVEILLANCE AROUND COASTAL NUCLEAR INSTALLATIONS.
T. R. Folsom, and V. F. Hodge. 1973, 13p SM-180/36
Contract AT(04-3)-34

Descriptors: (*San onofre-1 reactor, *Radioactive wastes), (*Coastal waters, *Radiation monitoring), (*Aquatic ecosystems, *Radionuclide migration), (*Plutonium 239, Radiation monitoring), Cesium 137, Cobalt 58, Cobalt 60, Contamination, Isomeric nuclei, Marine disposal, Plutonium 238, Potassium 40, Radioactive waste disposal, Radioactivity, Reactors, Silver 108, Silver 110.

For abstract, see NSA 30 08, number 21108.

COO-1156-68 PC$4.00/MF$2.25
Colorado State Univ., Fort Collins Dept. of Radiology and Radiation Biology.
PLUTONIUM BEHAVIOR IN THE TERRESTRIAL ENVIRONS OF THE ROCKY FLATS INSTALLATION.
F. W. Whicker, C. A. Little, and T. F. Winsor. 1973, 15p CONF-731117-5, SM-180-45
Contract AT(11-1)-1156

Descriptors: (*Rocky flats plant, *Radioactive waste disposal), (*Plutonium 239, *Radioecological concentration), (*Soils, *Radionuclide migration), (*Ecosystems, Radionuclide migration), Animals, Contamination, Diffusion, Earth atmosphere, Environment, Gaseous wastes, Liquid wastes, Plants, Quantitative chemical analysis, Radiation monitoring, Radioactive aerosols, Radioactive wastes, Radionuclide kinetics, Stack disposal, Wind.

For abstract, see NSA 30 08, number 21104.

KFK-EXT-23/74-1 PC$4.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Medizinische Abt.
RESULTS OF MONITORING FOR TRITIUM INCORPORATION AT THE KARLSRUHE NUCLEAR RESEARCH CENTER IN 1973.
H. Schieferdecker, and E. Wechselberger. Apr 74, 10p
In German. U.S. Sales Only.

Descriptors: (*Tritium, *Radiation monitoring), (*Kernforschungszentrum karlsruhe, *Personnel monitoring), Fr-2 reactor, Heavy water moderated reactors, Personnel, Radiation doses, Uptake.

For abstract, see NSA 30 08, number 21071.

KFK-1899 PC$13.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Abt. Strahlenschutz und Sicherheit.
MEETING ON MONITORING ROOM AND EXHAUST AIR FOR RADIOACTIVITY, KARLSRUHE, NOVEMBER 15–16, 1973.
L. A. Koenig. Mar 74, 210p
In German and English. U.S. Sales Only.

Descriptors: (*Aerosol monitoring, *Meetings), Leading abstract, Radiation monitoring.

For abstract, see NSA 30 08, number 21088.

LA-5586 PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
ENVIRONMENTAL SURVEILLANCE AT LOS ALAMOS DURING 1973.
K. J. Schiager, and K. E. Apt. May 74, 63p
Contract W-7405-eng-36

Descriptors: (*New mexico, *Radioactivity), (*Tritium, *Radiation monitoring), (*Earth atmosphere, Radiation monitoring), Alpha sources, Americium 241, Atmospheric precipitations, Beta sources, Cesium 137, Ecosystems, Ground water, Human populations, Lasl, Liquid wastes, Meteorology, Plutonium 238, Plutonium 239, Quantitative chemical analysis, Radiation doses, Radionuclide migration, Sediments, Soils, Strontium 89, Strontium 90, Surface air, Surface waters, Temperature monitoring, Uranium.

For abstract, see NSA 30 08, number 21072.

LA-5602-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
CALCULATION OF STEAM FLOW AND HYDRAULIC FRACTURING IN A POROUS MEDIUM WITH THE KRAK CODE.
C. E. Keller, A. H. Davis, and J. N. Jr. Stewart. May 74, 23p
Contract W-7405-eng-36

Descriptors: (*Nuclear explosions, *Underground explosions), (*Steam, *Flow rate), (*Water, Flow rate), Cavities, Computer calculations, Cracks, Fracturing, K codes, Porosity, Rocks.

For abstract, see NSA 30 08, number 21028.

LA-5636-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
WATER SUPPLY AT LOS ALAMOS DURING 1973.
W. D. Purtymun, and J. E. Herceq. Jun 74, 30p
Contract W-7405-eng-36

Descriptors: (*New mexico, *Water resources), Hydrology, Water reservoirs.

For abstract, see NSA 30 08, number 21175.

LFEN-158(B) PC$5.25/MF$2.25
Junta de Energia Nuclear, Sacavem (Portugal). Lab. de Fisica e Engenharia Nucleares.
ENVIRONMENTAL RADIOACTIVITY MEASUREMENTS AT THE LABORATORIO DE FISICA E ENGENHARIA NUCLEARES (1966–1970).
M. M. Godinho, R. Teixeira, M. R. Teixeira, M. M. Bordalo, and P. E. Costa. 1973, 44p
U.S. Sales Only.

Descriptors: (*Portugal, *Fallout), (*Surface air, *Radiation monitoring), (*Rain water, Radiation monitoring), (*Drinking water, Radiation monitoring), Beta sources, Cesium 137, Gamma spectrometers, Iodine 131, Plants, Radioecological concentration, Radionuclide kinetics, Strontium 90.

For abstract, see NSA 30 08, number 21073.

N-2200 PC$4.00/MF$2.25
Chicago Univ., Ill.
MEDICAL INDUSTRIAL HAZARDS SECTION REPORT FOR MONTH OF JANUARY 1946.
J. J. Nickson. 19 Jan 46, 7p

Descriptors: (*Plutonium, *Radiation monitoring), (*Urine, *Radioactivity), (*Man, *Radionuclide kinetics), Air, Alpha sources, Beta sources, Environment, Gamma sources, Hands, Personnel, Personnel dosimetry, Personnel monitoring, Protective clothing, Radiometric analysis, Sampling, Uptake, Excretion, Injection, Renal clearance, Time dependence.

For abstract, see NSA 30 08, number 21074.

N-2224 PC$4.00/MF$2.25
Chicago Univ., Ill.
MEDICAL INDUSTRIAL HAZARDS SECTION REPORT FOR MONTH OF FEBRUARY 1946.
J. J. Nickson. 21 Feb 46, 5p

Descriptors: (*Plutonium, *Radiation monitoring), (*Urine, *Radioactivity), Air, Alpha sources, Environment, Excretion, Personnel, Personnel dosimetry, Personnel monitoring, Radiometric analysis, Sampling, Surface contamination, Uptake.

For abstract, see NSA 30 08, number 21075.

N-2261 PC$4.00/MF$2.25
Chicago Univ., Ill.
MEDICAL INDUSTRIAL HAZARDS SECTION REPORT FOR MONTHS MARCH AND APRIL 1946.
J. J. Nickson. 22 Apr 46, 6p

Descriptors: (*Personnel, *Radiation monitoring), (*Plutonium, *Excretion), (*Dogs, *Radionuclide kinetics), Alpha sources, Environment, Explosions, Personnel dosimetry, Radioactivity, Radiometric analysis, Sampling, Silver compounds, Surface contamination, Urine, Bal, Body, Injection, Removal, Solutions, Testing, Therapy, Zirconium.

For abstract, see NSA 30 08, number 21076.

N74-29712/8GA PC$5.25/MF$2.25
Alabama A & M Univ., Normal.
INVESTIGATION OF WATER QUALITY PARAMETERS AT SELECTED POINTS ON THE TENNESSEE RIVER.
Final Report, 1 Jun. 1972 - 1 Sep. 1973.
M. C. Manger. 1 Sep 73, 43p NASA-CR-139365
Contract NGR-01-001-018

Descriptors: *Rivers, *Tennessee, *Water quality, Sampling, Temperature measurement, Water temperature.

For abstract, see STAR 1219

N74-30833/9GA PC$25.25/MF$2.25
International Business Machines Corp., Huntsville, Ala.

A STUDY OF REMOTE SENSING AS APPLIED TO REGIONAL AND SMALL WATERSHEDS. VOLUME 2: SUPPORTING TECHNICAL DETAILS.
Final Report.
28 Jun 74, 442p NASA-CR-139035, IBM-74W-00176-VOL-2
Contract NAS5-21942

Descriptors: *Computerized simulation, *Environment models, *Remote sensors, *Watersheds, Alabama, Calibrating, Colorado, Computer programs, Data bases, Independent variables, Louisiana, Rivers, Streams, Tables (Data).

For abstract, see STAR 1220

ORNL-4974 PC$5.45/MF$2.25
Oak Ridge National Lab., Tenn.
APPLIED HEALTH PHYSICS AND SAFETY ANNUAL REPORT FOR 1973.
Aug 74, 56p
Contract W-7405-eng-26

Descriptors: (*Ornl, *Personnel monitoring), (*Radioactive waste disposal, *Radiation monitoring), (*Clinch river, Radiation monitoring), (*Beta sources, Radiation monitoring), Cesium 137, Environment, Fishes, Gaseous wastes, Iodine 131, Liquid wastes, Milk, Niobium 95, Personnel, Radiation doses, Radioactivity, Rain water, Ruthenium 106, Strontium 90, Surface air, Transuranium elements, Tritium, Zirconium 95.

For abstract, see NSA 30 08, number 21077.

PB-235 256/5GA PC$8.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
A BAYESIAN APPROACH TO HYDROLOGIC TIME SERIES MODELING,
Guillermo J. Vicens, Ignacio Rodriquez-Iturbe, and John C. Schaake, Jr. Mar 74, 288p* 181, R74-14 W74-11456, OWRR-C-4118(9021)(4)
Grant NSF-GK-41643

Descriptors: *Streamflow, *Hydrology, *Time series analysis, Water resources, Regional planning, Bayes theorem, Probability theory, Regression analysis, Mathematical models.

This work has two objectives. First, to develop a procedure that explicitly accounts for the parameter uncertainties in water resources planning; and second, to investigate the use of regional information in conjunction with the historical recored to reduce the parameter uncertainties. To attain these goals, Bayesian procedures have been applied to the following hydrologic time series models of annual streamflows: (1) Independent Normal Process, (2) Independent Log-Normal Process, (3) First-Order Normal Autoregressive Process, and (4) First-Order Log-Normal Autoregressive Process. (Modified author abstract)

PB-235 261/5GA PC$3.75/MF$2.25
Alaska Univ., College. Inst. of Water Resources.
METHODS OF FLOOD FLOW DETERMINATION IN SPARSE DATA REGIONS,
Robert F. Carlson, Patricia M. Fox, and Stephen D. Shrader. Jun 74, 41p IWR-52 W74-11458, OWRR-B-021-ALAS(1)

Descriptors: *Flood forecasting, *Alaska, Design, History, Arctic regions, Hydrology, Mathematical models, Regression analysis, Errors.
Identifiers: Remote areas.

Three issues must be understood when embarking on a flood frequency design task: the fundamental basis of the design method, actual execution of the task, and the data environment. A survey of the history and background of the many methods of flood frequency determination is included, followed by a description of the methods currently used by design agencies in Alaska. The physical environment of Alaska is described including identification of four homogenous physiographic regions. The data conditions are also described for these regions. With this information three methods were chosen for further evaluation: log Pearson type III, graphical and regional multiple regression. These methods were chosen primarily on the basis of applicability to sparse data regions; ease of calculation; superficial satisfaction of underlying assumptions; and general acceptance and/or previous use in Alaska.

PB-235 855/4GA PC$7.00/MF$2.25
Ohio State Univ., Columbus. Water Resources Center.
DETERMINATION OF TRACE METAL POLLUTANTS IN WATER RESOURCES AND STREAM SEDIMENTS.
Final rept. 1 Jul 72-30 Jun 74,
Charles R. Cothern. 1974, 185p 424X W74-12194, OWRR-B-044-OHIO (1)

Descriptors: *Water pollution, *Sediments, *Water analysis, *Trace elements, Chemical analysis, X ray analysis, X ray fluorescence, Calibration, Isotopic labeling, Organic compounds, Plant physiology, Electron microscopy, Calibration, Zinc, Cadmium, Strontium, Lake Erie, Great Miami River, Ohio.
Identifiers: Electron spectroscopy, Auger electron spectroscopy.

Studies were conducted concerning development of the technique of X-ray fluorescence (XRF) and electron spectroscopy for chemical analysis (ESCA) for trace metal analysis. Four independent techniques for quantitatively calibrating an XRF spectrometer were compared showing the most reliable to be the semi-theoretical method. A new method of peak spectra analysis was developed. Electron excitation was shown to be a poor alternative to proton excitation. The technique of XRF was used to determine trace element concentration in Lake Erie sediments and water samples from the Great Miami River. This latter study revealed the importance of determining both the dissolved and suspended loads. A method was developed for energy calibrating an ESCA spectrometer for environmental samples. This method was applied to several zinc compounds and used to identify molecular species in sediments. It was shown that ESCA can be applied to both inorganic and organic environmental samples. A radioactive isotope tracer technique was used to determine the uptake of Zn, Sr and Cd in buckwheat plants. This study showed synergistic effects between these elements. (Modified author abstract)

PB-235 906/5GA PC$4.25/MF$2.25
Minnesota Univ., Minneapolis. Water Resources Research Center.
PHYTOPLANKTON NUTRITION AND PHOTOSYNTHESIS IN LAKE MINNETONKA AND LAKES AT FAIRMONT, MINNESOTA.
R. O. Megard. Jul 74, 73p W74-12227, OWRR-A-026-MINN(3)

Descriptors: *Limnology, *Phytoplankton, *Photosynthesis, Algae, Lakes, Minnesota, Chlorophylls, Phosphorus, Carbon compounds, Water chemistry, Water quality, Water pollution, Lake Minnetonka.

Abundance of phytoplankton, rates of photosynthesis, concentrations of dissolved substances and other limnological features of Lake Minnetonka, near Minneapolis, and of five lakes near Fairmont, Minnesota, were studied. Fluctuations of population densities of phytoplankton in four basins of Lake Minnetonka were inferred from changes of concentrations of chlorophyll a and particulate organic carbon (POC) during the ice-free season. Concentrations of chlorophyll a during 1972 and 1973 were similar to those during 1968 and 1969 except in the lake's largest basin, where concentrations during 1972 and 1973 were only about 50% as high as during 1968 and 1969. The decrease of chlorophyll is attributable to the reduced influx of phosphorus, which decreased from about 13 metric tons/year because sewage effluents were diverted away from the basin during the winter of 1971-72. Population densities of phytoplankton in the five lakes at Fairmont, in southern Minnesota are higher than in Lake Minnetonka.

PB-235 913/1GA PC$3.25/MF$2.25
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
LAND SUBSIDENCE: AN ECONOMIC ANALYSIS.
Completion rept.,
Charles McCauley, and Russell Gum. 1974, 13p W74-12225, OWRR-A-030-ARIZ(2)
Contract DI-14-31-0001-3503

Descriptors: *Hydrogeology, *Land use, *Economic analysis, Water level, Ground water, Water consumption, Damage, Cost estimates, Aquifers, Cracks, Subsistence, Arizona.
Identifiers: Land subsidence.

Land subsidence due to groundwater overdraft has been assumed to be one of Arizona's major water related problems. The premise is investigated from an economic point of view. It is concluded that in the case of Arizona the physical fact of land subsidence has little or no economic significance.

PB-236 066/7GA PC$3.75/MF$2.25
South Dakota State Univ., Brookings. Water Resources Inst.
ORIGIN OF THE LARGE RESURGENT SPRINGS OF THE BLACK HILLS AREA, SOUTH DAKOTA.
Final rept.,
Perry H. Rahn, and J. P. Gries. Feb 73, 27p W74-12367, OWRR-A-021-SDAK(2)

Descriptors: *Ground water, *Water flow, Ground water recharge, Springs(Water), South Dakota, Wyoming, Precipitation(Meteorology), Evapotranspiration, Flow measurement, Black Hills.

Between 1966 and 1971, monthly stream gagings were conducted on most large streams and springs in the Black Hills of South Dakota and Wyoming. Streams draining the impermeable Precambrian core of the Hills lose an average of 40.5 cfs to sinkholes where streams cross the Paleozoic limestone belt flanking the Precambrian core. At the outer edge of the limestone large springs occur where the Triassic Spearfish acts as an impermeable dam to ground water. The average of these springs is at least 189.4 cfs. The difference between the stream flow loss and the spring discharge is due to precipitation recharge falling directly on the limestone. Since there is probably little deep groundwater loss from this system, precipitation recharge and evapotranspiration rates on the limestone can be established.

PEL-229 PC$4.00/MF$2.25
Atomic Energy Board, Pelindaba, Pretoria (South Africa).
ENVIRONMENTAL RADIOACTIVITY AT THE NATIONAL NUCLEAR RESEARCH CENTRE, PELINDABA. REPORT FOR THE YEAR 1972.
D. van As, and C. M. Vieggaar. Nov 73, 20p
U.S. Sales Only.

Descriptors: (*South africa, *Radioactivity), (*Surface waters, *Radiation monitoring), (*Iodine 131, Radiation monitoring), (*Strontium 90, Radiation monitoring), Alpha sources, Beta sources, Cesium 137, Fallout, Fishes, Gaseous wastes, Liquid wastes, Marine disposal, Milk, Radioactive wastes, Radioecological concentration, Radionuclide kinetics, Sediments, Stack disposal.

For abstract, see NSA 30 08, number 21078.

RD/B/N-2931 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
TRANSPORT OF ADSORBING, RADIOACTIVE SPECIES IN A NON-ISOTHERMAL POROUS MEDIUM.
R. S. Rodliffe. Feb 74, 10p RPC/M3FPR/P-(74)3
U.S. Sales Only.

Descriptors: (*Radioisotopes, *Mass transfer), Adsorption, Adsorption, Analytical solution, Convection, Desorption, Fission products, Flow models, Gas flow, Gaseous diffusion, Porosity.

For abstract, see NSA 30 08, number 21105.

RFP-Trans-162 PC$4.00/MF$2.25
AN SSSR, Syktyvkar. Inst. Biologii.
DISTRIBUTION AND REDISTRIBUTION OF URANIUM, RADIUM, AND THORIUM IN NATURAL BIOGEOCENOSES.
I. N. Verkhovskaya, P. P. Vavilov, and V. I. Maslov. 11p
Translated from pp 243-256 of Radioekologicheskie issledovaniya v prirodnykh biogeotsenozakh, Izdatel'stvo Nauk, Moscow, 1972.

Descriptors: (*Soils, *Radionuclide migration), (*Ground water, Radionuclide migration), (*Plants, *Radionuclide kinetics), (*Animals, Radionuclide kinetics), Diffusion, Distribution, Ecosystems, Food chains, Natural radioactivity, Radioecological concentration, Radium, Thorium, Uranium.

For abstract, see NSA 30 08, number 21080.

RFP-2164 PC$4.00/MF$2.25
Dow Chemical Co., Denver, Colo. Rocky Flats Div.
CESIUM-137 FALLOUT IN RED DESERT BASIN OF WYOMING, USA.
D. E. Michels. 15 Jul 74, 8p
Contract AT(29-1)-1106

Descriptors: (*Wyoming, Fallout), (*Cesium 137, *Radiation monitoring), (*Fallout, Radiation monitoring), (*Deserts, Fallout), Atmospheric precipitations, Climates, Plants, Soils, Topography, Wind.

For abstract, see NSA 30 08, number 21079.

RLO-2227-T12-42 PC$9.00/MF$2.25
Oregon State Univ., Corvallis.
LOSS OF ZINC-65 AND MANGANESE-54 FROM THE FRESHWATER MOLLUSC ANODONTA.
P. J. Harney. Jun 74, 116p

Descriptors: (*Zinc 65, *Radioecological concentration), (*Manganese 54, Radioecological concentration), (*Molluscs, *Radionuclide kinetics), (*Columbia river, *Ecology), Aquatic ecosystems, Environment, Excretion, Food chains, Ingestion, Radioactivity, Radionuclide migration, Retention, Sediments, Uptake.

For abstract, see NSA 30 08, number 21126.

SR-639-14 PC$15.25/MF$2.25
Georgia Univ., Athens Dept. of Zoology; Georgia Univ., Sapelo Island Marine Inst.
FLUX OF RADIONUCLIDES THROUGH A SALT MARSH. PROGRESS REPORT, JULY 1, 1973–JUNE 30, 1974.
L. R. Pomeroy, E. P. Odum, and R. J. Reimold. 10 Jun 74, 243p

Descriptors: (*Aquatic ecosystems, *Minerals), (*Seawater, Minerals), Crustaceans, Georgia, Mathematical models, Phosphorus, Plants, Population dynamics, Radionuclide migration, Sampling.

For abstract, see NSA 30 08, number 21127.

TID-3910(Suppl.9) PC$5.45/MF$2.25
Washington State Univ., Pullman Dept. of Zoology.
TERRESTRIAL AND FRESHWATER RADIOECOLOGY. A SELECTED BIBLIOGRAPHY.
A. W. Jr. Klement, and V. Schultz. 1974, 125p

Descriptors: (*Radioecology, *Bibliographies), Aquatic ecosystems, Terrestrial ecosystems.

For abstract, see NSA 30 08, number 21128.

UCID-16537 PC$5.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
NUMERICAL SIMULATION OF THE TRANSPORT AND DIFFUSION OF NUCLEAR CLOUDS IN 3-DIMENSIONS.
R. Lange, and J. B. Knox. 9 Jul 74, 45p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Radioactive clouds), (*Radioactive clouds, *Diffusion), (*Radioactive waste disposal, *Stack disposal), (*Fission products, *Washout), A codes, Atmospheric explosions, Correlations, Earth atmosphere, Gaseous wastes, Mathematical models, Meteorology, Nrts, Plumes, Radioactivity, Rain, Tracer techniques, Wind.

For abstract, see NSA 30 08, number 21098.

8I. Mining Engineering

BVLI-27 PC$8.00/MF$2.25
Bergverkenes Landssammenslutnings Industrigruppe, Trondheim (Norway).
RADON MEASUREMENTS IN NORWEGIAN MINES.
T. Myran. Apr 73, 91p
In Norwegian. U.S. Sales Only.

Descriptors: (*Mines, *Radioactivity), (*Radon, *Radiation monitoring), (*Norway, Radioactivity), Daughter products, Daily variations, Diffusion, Geology, Ground water, Radon 222, Rocks, Seasonal variations, Thorium minerals, Uranium minerals, Uranium 238, Ventilation, Biological radiation effects, Dusts, Lungs, Miners, Neoplasms, Pneumoconioses, Synergism.

For abstract, see NSA 30 08, number 21045.

KFK-1957 PC$5.25/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Projekt Actiniden.
COMPACT SYSTEM FOR EXPLORATION AND ANALYSIS OF MANGANESE NODULES.
W. Stegmaier, K. Borcherding, L. Boesch, U. Fanger, and I. Lange. Apr 74, 43p
In German. U.S. Sales Only.

Descriptors: (*Manganese, *Exploration), Chemical analysis, Economics, Metals, Mining, Regional analysis, Seas, Sediments, Topography.

For abstract, see NSA 30 08, number 23416.

PB-235 616/0GA PC$4.75/MF$2.25
IIT Research Inst., Chicago, Ill.
COAL MINING USING HIGH PRESSURE WATER JETS.
Final rept. May 71-Oct 73,
Madan M. Singh, Thomas J. Labus, and Lawrence A. Finlayson. Oct 73, 90p BuMines-OFR-43-74
Contract H0111789

Descriptors: *Hydraulic mining, *Coal mining, Rock excavation, Hydraulic jets, Coal dust, Noise(Sound), Equipment specifications, Production rate, Feasibility.

Engineering feasibility of high-pressure water-jet coal mining and degree of dust and noise health hazards associated with this mining technique were studied. A portable water jet device suitable for field use was designed, fabricated, and tested. The results indicated that with a hydraulic jet operating at 50,000 and 100,000 psi, the amount of dust produced per ton of coal is less than with conventional miners. The noise levels produced are comparable with noise levels of conventional miners and were not optimized. Thus, it is probable that noise levels can be reduced below that of conventional miners. A miner using several jet units similar to the prototype should be able to mine at rates comparable to conventional mechanical miners. This would allow mining with reduced dust and noise, consequently reducing exposure of operators to the hazards of black lung and hearing loss.

PB-235 849/7GA PC$5.25/MF$2.25
Colorado School of Mines, Golden. Dept. of Chemical and Petroleum Refining Engineering.
REMOVAL OF SULFUR FROM COAL BY TREATMENT WITH HYDROGEN. PHASE I: THE EFFECT OF OPERATING VARIABLES AND RAW MATERIAL PROPERTIES.
Interim rept. no. 1, May 72-May 73,
James H. Gary, R. M. Baldwin, C. Y. Bao, M. Kirchner, and J. O. Golden. May 74, 110p OCR-77-INT-1
Contract DI-14-32-0001-1225
Paper copy also available from GPO PC$1.40.

Descriptors: *Coal preparation, *Desulfurization, Beneficiation, Hydrogen, Slurries, Solvent extraction, Reaction time, Heat measurement, Differential pressure, Bituminous coal, Subbituminous coal, Vacuum distillation.
Identifiers: *Solvent refined coal.

A review is presented of experiments conducted to determine whether reaction temperature, pressure, reaction time, solvent type, and solvent to coal ratio have a significant effect on the desulfurization of coal by hydrogen treatment. The process consisted of reacting a coal-solvent slurry with hydrogen treatment. The process consisted of reacting a coal-solvent slurry with hydrogen at elevated temperatures and pressures in a batch autoclave rocking bomb reactor. Vacuum distillation was used to recover the solvent resulting in a solid low-sulfur removal and the removal of the forms of sulfur (organic, pyritic and sulfate) in the coal samples.

PB-235 854/7GA PC$4.25/MF$2.25
California Univ., Berkeley. Petroleum Engineering Lab.
EFFECT OF STRESS ON PERMEABILITY OF COAL.
Final rept. 24 Aug 71-30 Jun 74,
W. H. Somerton, I. M. Soylemezoglu, and R. C. Dudley. Apr 74, 62p BuMines-OFR-45-74
Contract H0122027

Descriptors: *Bituminous coal, *Permeability, *Stresses, Gas flow, Fracture properties, Coal mines, Nitrogen, Methane, Axial flow, Acoustic measurement, Deformation, Test methods, Pore pressure, Compressive properties, Porosity, Sampling.

The permeabilities of three types of bituminous coals were measured under several stress conditions which were to simulate possible states of stress in underground environments to depths of 2,000 feet. Nitrogen and methane were flowed in the axial direction through 2-inch-diameter by 3-inch-length specimens. The few radial tests that were run agreed favorably with the axial flow tests. Sonic velocities were measured concurrently with permeability tests, and dynamic and static deformation moduli and bulk and pore compressibilities were determined. The study found that the permeabilities of different samples of the same coal varied over a wide range, that permeabilities decreased by one to two orders of magnitude with increasing stress, and that the permeability of coal is very dependent on previous loading and unloading of the sample.

SLA-74-0248 PC$4.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
DYNAMIC RESPONSE OF GEOLOGICAL MATERIALS TO PULSED ELECTRON BEAM DEPOSITION.
G. A. Carlson, and T. M. Kerley. Jul 74, 25p
Contract AT(29-1)-789

Descriptors: Electron beams, Excavation, Fracturing, Granites, Mining, Pulses, Rock drilling, Rocks, Tensile properties.

For abstract, see NSA 30 08, number 23482.

8J. Physical Oceanography

AD-785 867/3GA PC$4.25/MF$2.25
Texas Univ Austin Applied Research Labs
THE PENETRATION OF HIGHLY DIRECTIONAL ACOUSTIC BEAMS INTO A SEDIMENTARY BOTTOM. PART I.
Technical rept. 1 Apr-16 Jul 74,
Claude W. Horton, Sr. 16 Jul 74, 65p Rept no. ARL-TR-74-28-Pt-1
Contract N00014-70-A-0166-0008

Descriptors: *Ocean bottom, *Sediments, *Acoustic properties, Underwater sound, Acoustic velocity, Acoustic attenuation.
Identifiers: Phase velocity, Wave equations.

The following theoretical problem is solved. What is the pressure field in an underlying medium when a highly directional acoustic beam in water impinges on the bottom sediments. The acoustic velocity in the bottom is larger than that of the water, and the velocity ratio is such that plane wave theory predicts total internal reflection (in the absence of attenuation) at a grazing angle near 28 degrees. The incident beam is represented by a bundle of plane waves, and an approximate expression for the resulting pressure field in the bottom is obtained by the principle of stationary phase. In Part I it is assumed that all of the plane waves in the bundle have the same phase. In Part II a phase structure will be introduced in order to represent the nearfield of the source. (Modified author abstract)

AD-785 905/1GA PC$9.25/MF$2.25
Office of Naval Research Arlington Va
REPORT AVAILABILITY NOTICE, SUMMER 1974,
William V. Kielhorn. 1974, 311p* Rept no. ONR-ACR-199
See also report dated 1973, AD-770 451.

Descriptors: *Oceanographic data, *Abstracts, *Naval research, Sea water, Ocean bottom topography, Marine biology, Underwater sound, Marine geophysics, Air water interactions, Marine meteorology, Summer, Upwelling.

This is one of a series of reports consisting of abstracts of recent technical reports in various areas of Oceanography, generated by contractors sponsored by the Office of Naval Research.

AD-786 012/5GA PC$3.25/MF$2.25
Saclant ASW Research Centre La Spezia (Italy)
OCEANOGRAPHIC SUMMARY OF THE BARENTS SEA SOUTH OF BEAR ISLAND IN THE SUMMER.
Memorandum rept.,
Leslie A. Foster, Ola M. Johannessen, and Cinzia Isoppo. 1 Sep 74, 19p Rept no. SACLANTCEN-SM-52

Descriptors: *Oceanographic data, *Barents Sea, Bathymetry, Summer, Temperature, Salinity, Underwater sound signals, Acoustic velocity, Isotherms, Ocean currents, Thermoclines, Arctic regions, Fisheries, Polar regions.
Identifiers: Bear Island, International Council for the Exploration of the Sea.

Using published articles, data reports and other historical data, a brief summary of the oceanography of the region between Bear Island and Norway is presented. The main feature of this area is a frontal region formed where the warm Atlantic water and cold Polar water meet; steep temperature, salinity and sound speed gradients occur in this region. The position of the front can vary by about 30 nautical miles from year to year. (Author)

AD-786 136/2GA PC$7.25/MF$2.25
Naval Oceanographic Office Washington D C
OCEANOGRAPHIC SURVEY REPORT, SEA OF JAPAN.
Special pub. (Final) for Oct 67-Jun 68.
May 74, 221p Rept no. N00-SP-133-18-1

Descriptors: *Oceanographic data, *Japan Sea, Ocean currents, Marine geophysics, Bathymetry, Oceanographic ships, Marine geology, Salinity, Underwater sound, Thermoclines, Echo ranging, Temperature, Geomagnetism, Sediments, Deep water, Surface waters, Korea.
Identifiers: Japan Basin, Tartar Trough, Yamato Ridge.

A geological/geophysical and oceanographic survey was conducted in the Sea of Japan from October 1967 to June 1968 aboard the USNS SILAS BENT and the R/V F. V. HUNT. Dominant physiographic features of the sea are: Japan Basin (including Japan Abyssal Plain), Tatar Trough, Yamato Ridge, Korea Continental Borderland, and the continental slope. Three major stratigraphic units were recognized in the seismic profiles: (1) basement, (2) folded, faulted, and discontinuous sediments overlying basement, and (3) flat uppermost sediments. Most of the cored sediments were in the fine-silt to clay range; however, Japan Abyssal Plain had coarsed-textured turbidities. Large seasonal changes in surface water properties were observed. An extensive list of references is included in the report. (Modified author abstract)

COM-74-11548/6GA PC$3.25/MF$2.25
National Oceanographic Instrumentation Center, Washington, D.C.
TYPE 602 DIGITAL SALINITY, TEMPERATURE, AND DEPTH INSTRUMENT, BRAINCON CORPORATION, MARION, MASS. 02738.
Instrument fact sheet.
Jul 74, 13p IFS-75001 NOAA-74090605

Descriptors: *Oceanographic data, *Measuring instruments, Instrument characteristics, Ocean environments, Salinity, Temperature measurement, Depth, Performance evaluation, Specifications, Electrical resistivity.
Identifiers: STD instruments, *Oceanographic equipment.

The Braincon Type 602 Digital Salinity/Temperature/Depth instrument is designed to measure and record the ocean variables of salinity, temperature, and depth. Salinity data are derived from processing the output of an inductive-type conductivity cell; temperature is sensed by a platinum, resistance-wire thermometer; and pressure is sensed with a strain-gage, bridge transducer. The programable cycle timer turns on the instrument power, sequentially digitizes and records the sensor outputs in serial BCD format on magnetic tape, and then returns the instrument to its quiescent state.

N74-30838/8GA PC$4.50/MF$2.25
California Univ., Los Angeles. Inst. of Geophysics and Planetary Physics.
THERMAL ALTERATION OF ORGANIC MATTER IN RECENT MARINE SEDIMENTS. I: PIGMENTS.
R. Ikan, Z. Aizenshtat, M. J. Baedecker, and I. R. Kaplan. 1974, 28p NASA-CR-139394, PUBL-1243
Contract NGR-05-007-221

Descriptors: *Coastal water, *Photosynthesis, *Pigments, *Sediments, *Southern california, Chlorophylls, Continental shelves, Heat treatment.

For abstract, see STAR 1220

N74-30839/6GA PC$5.25/MF$2.25
California Univ., Los Angeles. Dept. of Geophysics and Planetary Physics.
THERMAL ALTERATION OF ORGANIC MATTER IN RECENT MARINE SEDIMENTS. 2: ISOPRENOIDS.
R. Ikan, M. J. Baedecker, and I. R. Kaplan. 1974, 45p NASA-CR-139195, PUBL-1244
Contract NGR-05-007-221

Descriptors: *Coastal water, *Heat treatment, *Organic compounds, *Sediments, *Southern california, Carbon compounds, Chemical composition, Hydrocarbons.

For abstract, see STAR 1220

RLO-2225-T-25-12 PC$23.00/MF$2.25
Washington Univ., Seattle Dept. of Oceanography.
COLUMBIA RIVER EFFECTS IN THE NORTHEAST PACIFIC: PHYSICAL OCEANOGRAPHY. REPORT OF PROGRESS, SEPTEMBER 1971–JANUARY 1974.
J. D. Smith, B. Hickey, and J. R. Beck. 13 May 74, 397p
Contract AT(45-1)-2225

Descriptors: Columbia river, Flow rate, Motion, Oceanography, Pacific ocean, Research programs, Seasonal variations.

For abstract, see NSA 30 08, number 21177.

8K. Seismology

DUN-1409 PC$4.00/MF$2.25
Douglas United Nuclear, Inc., Richland, Wash.
SEISMOLOGY REPORT ON WASHINGTON, IDAHO, NORTHERN OREGON AND WESTERN MONTANA, AND THE HANFORD AREA, WASHINGTON.
N. H. Rasmussen. 3 May 66, 17p

Descriptors: (*Washington, *Earthquakes), (*Oregon, Earthquakes), (*Utah, Earthquakes), (*Montana, Earthquakes), Seismic detection, Seismology.

For abstract, see NSA 30 08, number 21173.

SLA-74-185 PC$4.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
SHAKING-TABLE TESTS OF THE NGC-23 WIDEBAND VELOCITY SEISMOMETER SYSTEM.
L. F. Brady. May 74, 29p
Contract AT(29-1)-789

Descriptors: Amplifiers, California, Damping, Ground motion, Measuring methods, Nevada, Performance testing, Seismic detection, Seismic surveys, Seismology, Specifications, Utah.

For abstract, see NSA 30 08, number 23344.

UCID-16540 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
SEISMIC PROTECTION OF BURIED STRUCTURES.
A. Blake. 15 Sep 72, 13p
Contract W-7405-eng-48

Descriptors: (*Mechanical structures, *Seismic effects), (*Pipelines, Seismic effects), Containment systems, Earthquakes, Ground motion, Meetings, Nuclear power plants, Rocks, Safety, Seismic waves, Seismology, Soils, Underground, Underground explosions.

For abstract, see NSA 30 08, number 21034.

8L. Snow, Ice, and Permafrost

AD-785 631/3GA PC$3.25/MF$2.25
Cold Regions Research and Engineering Lab Hanover N H
A SEA ICE TERRAIN AND MOBILITY MODEL,
William D. Hibler, III. 1974, 16p

Descriptors: *Surface effect vehicles, *Sea ice, *Trafficability, Pack ice, Mobility, Probability density functions, Monte Carlo method.
Identifiers: Pressure ridges.

With the advent of a new generation of air cushion vehicles, often called surface effects vehicles (SEV), the nature of the Arctic pack ice as a vehicle terrain has taken on military and commercial significance. Because of this significance, studies have recently been carried out at USA CRREL in order to effectively characterize sea ice terrain for purposes of SEV mobility, as well as for other types of vehicles. These studies have involved aerial stereo photography, airborne laser profilometry, and ground measurements performed on the pack ice surface.

AD-785 813/7GA Reprint
Foundation for Glacier Research Seattle Wash
MEASUREMENT OF SURFACE STRAIN RATES IN GLACIERS USING EMBEDDED WIRE STRAIN GAGES,
B. Warner, and G. Cloud. 1974, 7p AROD-10139.1-GS
Grant DA-ARO-D-31-124-73-G185
Availability: Pub. in Experimental Mechanics, v14 n1 p24-28 Jan 74.

Descriptors: *Strain gages, *Strain rate, *Glaciers, Measurement, Deformation, Flow.

Natural scientists and engineers are continuing to seek on understanding of the mechanism of flow and deformation of glaciers. A necessary component of this exploration is the accurate determination of strain rates in glacier ice. The purpose of this investigation was to develop a strain-measuring method which is dependable and precise under difficult field conditions. (Modified author abstract)

AD-786 126/3GA PC$3.25/MF$2.25
Coast Guard Academy New London Conn
ICE SCOUR ON THE NORTHERN CONTINENTAL SHELF OF ALASKA.
Final rept.,
L. D. Brooks. 12 Jan 73, 19p Rept no. RDCGA-36

Descriptors: Ice Islands, *Alaska, Sea ice, Offshore, Storms, Icebreakers, Structures, Ice reporting, Aerial reconnaissance, Side looking sonar, Ice penetration, Arctic regions, Continental shelves.
Identifiers: Colville River, Prudhoe Bay, *Ice scour, North Slope.

There appears to be considerably less ice scouring inside the ten fathom curve than outside. The decrease is in frequency, width and length, however, there is little decrease in relief of scour. The ten fathom curve acts as a barrier sill to the relatively constant draft ice islands. Although they are grounded during heavy storms and with considerable scour, the ice islands are generally not permanently grounded. The design of any offshore facility on the North Slope must account for ice scour. (Author)

AD-786 127/1GA PC$3.75/MF$2.25
Coast Guard Academy New London Conn
INVESTIGATION OF ICE ISLAND SCOURING ON THE NORTHERN CONTINENTAL SHELF OF ALASKA.
Final rept.,
Bruce C. Skinner. 16 Nov 71, 28p Rept no. RDCGA-23

Descriptors: *Ice islands, *Alaska, Sea ice, Offshore, Deformation, Ice reporting, Bathymetry, Icebreakers, Hydrographic surveying, Icebergs, Side looking sonar, Ellesmere Island, Coastal regions, Arctic regions, Continental shelves.
Identifiers: Harrison Bay, Barter Island, *Ice scour.

Ice Islands (Tabular Ice Bergs) which break off the Ice Shelf of Ellsmere Island have been known to ground on the northern coast of Alaska. This survey was conducted to investigate the bottom deformation (scour) occurring when such islands ground. The detailed survey used Side Scanning Sonar, Sub Bottom Profiling, and detailed bathymetry from a Coast Guard Icebreaker in water depths of 50' - 200' on the northern continental shelf of Alaska between 29 Jul and 3 August 1971. Approximately 120 miles of detailed tracks between Harrison Bay and Barter Island were surveyed. The Side Scan Sonar records complemented by the bathymetry and sub-bottom records revealed areas of extensive bottom scouring, believed to be due to grounded ice features; either ice islands or deep pressure ridges. (Modified author abstract)

N74-29723/5GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
REMOTE PROFILING OF LAKE ICE THICKNESS USING A SHORT PULSE RADAR SYSTEM ABOARD A C-47 AIRCRAFT.
D. W. Cooper, J. E. Heighway, D. F. Shook, R. J. Jirberg, and R. S. Vickers. 1974, 4p NASA-TM-X-71588, E-8041
Conf-Proposed for Presentation at the 1974 Earth Environ. And Resources Conf., Philadelphia, 10-12 Sep. 1974.

Descriptors: *C-47 aircraft, *Radar measurement, *Remote sensors, Ice mapping, Ice reporting, Meteorological radar, Side-looking radar.

For abstract, see STAR 1219

8M. Soil Mechanics

AD-785 967/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
USE OF FOREST VEGETATION AS AN INDICATOR IN THE INTERPRETATION AND LARGE SCALE MAPPING OF SOILS IN A FOREST ZONE,
A. M. Berezin. 19 Nov 73, 14p Rept no. FSTC-HT-23-1297-73
Trans. of mono. Krupnomasshtabnoe Kartografiya Rastitelnosti (Large-Scale Mapping of Vegetation), Novosibirsk, 1970 p102-110.

Descriptors: *Forests, *Mapping, *Aerial photography, Soils, Geology, Vegetation, Translations, USSR.

Field research into forest types and their relations to soil types, types of tertiary deposits and underlying rocks were correlated with interpretation of the same items from aerial photographs, in selected regions of the Ukraine and Karelia. Aerial spectral region photographs proved to be more suitable than black and white aerial photos. The relationship of alluvial-slopewash deposits to ravine black alder, thick fluvioglacial sands covered with foxberry pine forests and organogenic deposits with rosemary-sphagnum pine forests are the most clearly interpreted from aerial photos. Further investigations in other regions should allow generalization of the results and their introduction into forest zone soil and tertiary deposit mapping.

PB-235 673/1GA PC$3.75/MF$2.25
Kentucky Univ., Lexington. Dept. of Civil Engineering.
CONSTRAINED AND SHEAR MODULI FOR FINITE ELEMENTS,
Vincent P. Drnevich. Jun 74, 36p Soil Mechanics Ser-18, UKY-TR85-74-CE22

Descriptors: *Soil mechanics, *Shear properties, Stresses, Strains, Matrices(Mathematics), Elastic properties.
Identifiers: *Finite element analysis.

The stress-strain matrix used in finite element analyses has been reformulated in terms of constrained and shear moduli. The new formulation partially uncouples shear and compression and is relatively independent of the relationships of elasticity. Simple hyperbolic functions have been proposed to define equivalent elastic compression and shear moduli for modeling nonlinear soil behavior. Straight forward procedures are provided to determine the parameters for the hyperbolic equations from conventional one dimensional compression and simple shear tests. In some cases, compression and shear wave propagation velocities measured insitu may also be used. For compatibility with many existing nonlinear finite element programs, either secant or tangent moduli may be developed. Several examples are given for the determination of the hyperbolic parameters from actual soil test data.

PB-235 949/5GA PC$5.25/MF$2.25
Transportation Research Board, Washington, D.C.
SOIL PROPERTIES.
1974, 121p TRB-TRR-497, ISBN-O-309-02287-8
Library of Congress Catalog Card no. 74-16830.

Descriptors: *Soil properties, *Highways, Clay soils, Soil compacting, Foundations, Pavements, Freezing, Melting, Sands, Pavement bases, Soil water, Friction, Soil texture, Bearing capacity, Laterites, Atterberg limits.

Contents:
- Effect of freeze-thaw on rheological characteristics of a compacted clay;
- Estimating the depth of pavement frost and thaw penetrations;
- Adfreezing of sands to concrete;
- Moisture variation in highway subgrades and the associated change in surface deflections;
- Effects on highway subdrainage of gradation and direction of flow within a densely graded base course material;
- Hydraulic erosion of cohesive soils;
- Determination of atterberg limits using moisture tension methods;
- The influence of cup friction and grading on the liquid limits of some Ghanaian soils;
- Dilatancy of granular media in triaxial shear;
- Identification of problem laterite soils in highway engineering: A review.

PB-236 107/9GA PC$3.75/MF$2.25
Missouri State Highway Dept., Jefferson City. Div. of Materials and Research.
MOISTURE, DENSITY AND SLOPE REQUIREMENTS IN HIGH FILLS.
Final rept. 1 Apr 71-1 Jan 74.
Jan 74, 48p 71-9

Descriptors: *Earth fills, *Slopes, *Soil stabilization, Stresses, Highways, Moisture, Soil compacting, Pore pressure, Shear strength, Settlement(Structural), Safety, Test methods, Consolidation, Missouri.

Eight soils commonly used in highway construction in Missouri were selected for study based on diversity in geologic origin, areal distribution and range in physical characteristics. Physical indices, consolidation and shear strength characteristics were determined. Theoretical pore pressures possible in field conditions were calculated based upon procedures outlined by Hilf. Effective stress stability analyses were performed to relate mold-

ing moisture at constant compactive effort to height to fill, angle of slope and factor of safety.

SLA-74-0201 PC$4.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
CYLINDRICAL CAVITY EXPANSION IN A LOCKING SOIL.
F. R. Norwood. Jul 74, 34p
Contract AT(29-1)-789

Descriptors: (*Cavities, *Expansion), (*Soils, *Mechanical properties), (*Snow, Mechanical properties), Compressibility, Configuration, Correlations, Deformation, Impact tests, Materials testing, Projectiles, Spheres.

For abstract, see NSA 30 08, number 23428.

UCID-16542 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
REVIEW OF LATERAL PRESSURE CRITERIA FOR STEMMING MATERIALS.
A. Blake. 18 Aug 74, 16p
Contract W-7405-Eng-48

Descriptors: Compacts, Friction, Mechanical structures, Motion, Pipes, Pressure measurement, Sand, Soils, Underground, Variations.

For abstract, see NSA 30 08, number 23432.

UCID-16543 PC$5.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
STRENGTH OF UNDERGROUND CAVITIES.
A. Blake. 13 Mar 72, 38p
Contract W-7405-Eng-48

Descriptors: (*Rocks, *Mechanical properties), (*Soils, Mechanical properties), Cavities, Cylindrical configuration, Elasticity, Mining, Plasticity, Pressure dependence, Spherical configuration, Stability, Strains, Stresses, Underground.

For abstract, see NSA 30 08, number 23433.

8N. Terrestrial Magnetism

LFEN-NL-79(a) PC$4.00/MF$2.25
Junta de Energia Nuclear, Sacavem (Portugal). Lab. de Fisica e Engenharia Nucleares.
NUCLEAR MAGNETIC RESONANCE MAGNETOMETER.
D. G. M. Santos. 1973, 20p
In Portuguese. U.S. Sales Only.

Descriptors: (*Magnetometers, *Performance), Design, Nuclear magnetic resonance, Operation.

For abstract, see NSA 30 08, number 23465.

N74-29709/4GA PC$4.00/MF$2.25
Instituto Geografico y Catastral, Madrid (Spain).
SECULAR VARIATION OF THE Z VERTICAL COMPONENT COMPARED WITH THEORETICAL MODELS VARIACION SECULAR DE LA COMPONENTE VERTICAL Z COMPARACION CON MODELOS TEORICOS.
F. Aranazydelrio. 1974, 19p
In Spanish; English Summary.

Descriptors: *Geomagnetism, *Magnetic anomalies, *Pogo effects, Mathematical models, Satellite observation.

For abstract, see STAR 1219

N74-29718/5GA PC$6.00/MF$2.25
Danish Meteorological Inst., Copenhagen.
THULE GEOPHYSICAL OBSERVATORY: MAGNETIC RESULTS 1970.
1974, 56p ISBN-87-7478-089-1

Descriptors: *Geomagnetism, *Greenland, *Magnetic fields, *Variometers, Data acquisition, Data processing, Tables (Data), Test equipment.

For abstract, see STAR 1219

N74-29720/1GA PC$6.00/MF$2.25
Danish Meteorological Inst., Charlottenlund.
GODHAVN GEOPHYSICAL OBSERVATORY: MAGNETIC RESULTS 1968.
1973, 56p ISBN-87-7478-068-9

Descriptors: *Denmark, *Geophysical observatories, *Magnetic recording, Data recording, Declination, Geomagnetism, Magnetic flux, Tables (Data), Variometers.

For abstract, see STAR 1219

N74-29721/9GA PC$6.00/MF$2.25
Danish Meteorological Inst., Charlottenlund.
THULE GEOPHYSICAL OBSERVATORY: MAGNETIC RESULTS 1968.
1973, 56p ISBN-87-7478-071-9

Descriptors: *Denmark, *Geophysical observatories, *Magnetic recording, Data recording, Declination, Geomagnetism, Magnetic flux, Tables (Data), Variometers.

For abstract, see STAR 1219

N74-29722/7GA PC$5.75/MF$2.25
Danish Meteorological Inst., Copenhagen.
THULE GEOPHYSICAL OBSERVATORY: MAGNETIC RESULTS 1969.
1974, 55p ISBN-87-7478-088-3

Descriptors: *Denmark, *Geophysical observatories, *Magnetic recording, Data recording, Declination, Geomagnetism, Magnetic flux, Tables (Data), Variometers.

For abstract, see STAR 1219

N74-30702/6GA PC$6.25/MF$2.25
Technische Universitaet, Munich (West Germany).
OBSERVATIONAL RESULTS FOR 1973 OBTAINED AT THE GEOMAGNETIC OBSERVATORY FUERSTENFELDBRUCK ERGEBNISSE DER BEOBACHTUNGEN AM ERDMAGNETISCHEN OBSERVATORIUM FUERSTENFELDBRUCK IM JAHRE 1973.
1974, 62p
Language in German.

Descriptors: *Geophysical observatories, *Germany, *Magnetic measurement, Geomagnetic pulsations, Geomagnetism, Magnetometers, Tables (Data).

For abstract, see STAR 1220

N74-30892/5GA PC$6.75/MF$2.25
Lockheed Missiles and Space Co., Sunnyvale, Calif. Lockheed Solar Observatory.
OPERATORS MANUAL FOR THE MAGNETOGRAPH PROGRAM (SECTION 2).
Final Report.
L. November, and A. M. Title. May 74, 73p
NASA-CR-120377, LMSC-D402244-SECT-2
Contract NAS8-28018

Descriptors: *Densitometers, *Magnetometers, *Recording instruments, *User manuals (Computer programs), Algorithms, Magnetic signatures, Spectroheliographs.

For abstract, see STAR 1220

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-785 661/0GA PC$3.25/MF$2.25
Harry Diamond Labs Washington D C
RADIATION SUSCEPTIBILITY OF HIGH POWER GAAS INFRARED LIGHT-EMITTING DIODES,
Roland A. Polimadei, Stewart Share, Arnold S. Epstein, and Gene E. Gowins. 1973, 15p

Descriptors: *Light emitting diodes, Radiation effects, Gallium arsenides, Infrared equipment, Gamma rays, Irradiation, Neutrons.

The paper reports the effects of gamma and neutron irradiation on the power output and efficiencies of a commercial, high-power GaAs LED of current interest to system designers.

AD-785 682/6GA PC$3.25/MF$2.25
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
A MICROWAVE TRANSPARENT METHOD OF COOLING MICROWAVE COMPONENTS, WITH PRACTICAL RESULTS,
B. L. Smith, H. L. Bassett, J. M. Schuchardt, and G. T. Colwell. 1974, 11p

Descriptors: *Waveguide windows, *Heat pipes, Cooling, Microwave equipment.

Microwave considerations often limit the means available for cooling waveguide-mounted components, to the detriment of performance. In fact, in high power microwave windows, thermal cracking is the usual average power limitation. The problem is further aggravated of the window is thin; heat conduction is along the long dimension of Figure 1a causing a maximum heat path length. It would be much better if heat could be made to flow laterally along the short path, and be removed directly from the faces of the heated areas. The paper describes a way to remove the heat as desired, using the heat pipe principle in a unique manner to provide a cooling path that has an effective conductivity much greater than that of solid copper, but is at the same time microwave transparent. The design of a working model of a heat pipe cooled microwave window is discussed.

AD-785 723/8GA PC$4.75/MF$2.25
RCA Corp Burlington Mass Government Communications and Automation Systems Div
MANUFACTURING METHOD AND TECHNOLOGY PROGRAM FOR AUTOMATED IMAGE DEVICE EVALUATOR (AIDE).
Quarterly progress rept. no. 2, 1 Apr-30 Jun 74,
J. F. McCarthy. Jul 74, 92p
Contract DAAB05-74-C-2524
See also report dated Apr 74, AD-782 882.

Descriptors: *Test equipment, Automation, Acceptance tests, Vidicons, Image intensifiers(Electronics).

The report presents the results of the Return Beam Vidicon (RBV) feasibility evaluation effort, the Applicability Analysis phase of the task and the initial equipment design accomplishments. Also included in the report is the recommended configuration of the demonstration model AIDE equipment. (Modified author abstract)

AD-785 737/8GA PC$4.75/MF$2.25
ITT Electron Tube Div Easton Pa
REPETITIVE SERIES INTERRUPTER.
Final rept. 1 Jul 73-30 Jun 74,
Charles L. Shackelford. Sep 74, 87p ECOM-73-0320-F
Contract DAAB07-73-C-0320
See also AD-780 086.

Descriptors: *Interrupters, Plasma devices, Magnetic fields, Interactions, Computer applications, Electronic switches.

Operating models of a current interrupter utilizing the interaction of a magnetic field and hydrogen plasma have been designed by empirical means, successfully built and tested. The device is capable of either momentary or permanent interruption of a direct current fault up to 200 amperes at 15 kilovolts. The normal average current rating is 0.8 ampere. A discussion of the preliminary tests and the design and test of the final state-of-the-art model is given. The magnetic modulator circuit which supplies the magnetic field is discussed. Areas for future exploration are listed. A parallel computer-aided design and synthesis approach was carried on. Progress toward a computer synthesizing program is discussed. (Author)

AD-785 743/6GA Reprint
California Univ Irvine Dept of Physics
VIBRATIONAL MODES ON A RECTANGULAR RIDGE.
Final rept.,
T. M. Sharon, A. A. Maradudin, and S. L. Cunningham. Apr 74, 16p Rept no. TR-74-20
Contract N00014-69-A-0200-9003, Grant AF-AFOSR-2018-71
Availability: Pub. in Letters in Applied and Engineering Sciences, v2 p161-174 1974.

Descriptors: *Elastic waves, *Waveguides, Propagation, Vibration, Acoustic waves, Surface waves, Acoustic equipment, Microwave equipment, Equations of motion.
Identifiers: Acoustic surface waves, Ridge waveguides.

The authors present a theory of elastic waves which propagate along and are localized at the top of a semi-infinite, rectangular ridge made up of a non-piezoelectric elastic medium. Stress-free boundary conditions are incorporated into the calculation by assuming position-dependent elastic constants. The equations of motion are solved numerically by expanding each displacement component in a double series made up of products of Legendre polynomials and Lguerre functions. Dispersion curves for the speeds of propagation of these ridge waves, as a function of ridge width, are presented. Comparison is made between the results of our theory and published experimental work. (Author)

AD-785 745/1GA Reprint
California Univ Irvine Dept of Physics
RECTANGULAR-RIDGE VIBRATIONAL MODES.
Final rept.,
T. M. Sharon, A. A. Maradudin, and S. L. Cunningham. 26 Apr 74, 4p Rept no. TR-74-17
Contract N00014-69-A-0200-9003, Grant AF-AFOSR-2018-71
Availability: Pub. in Electronics Letters, v10 n11, 30 May 74.

Descriptors: *Waveguides, *Elastic waves, Wave propagation, Vibration, Surface waves, Acoustic waves, Acoustic equipment, Microwave equipment.
Identifiers: Ridge waveguides, Acoustic surface waves.

The report presents a theoretical analysis of the mode spectrum for elastic waves localized at the top of a semi-infinite rectangular ridge. Their speeds of propagation were found to be well below the values obtained previously, where the ridge is supported by a substrate.

AD-785 856/6GA PC$3.75/MF$2.25
Princeton Univ N J Solid State and Materials Lab
ANNEALING STUDIES OF AL(+) IMPLANTED SIO2 THIN FILMS.
Technical rept.,
S. Wang, T. Russell, and B. S. H. Royce. 30 Aug 74, 26p Rept nos. PSSL-300874, 1184-AMS
Contract N00014-67-A-0151-0034
Presented at the CMOS/SOS Workshop Held at Washington, D.C. on 10 September 1974.

Descriptors: *Silicon dioxide, *Metal oxide semiconductors, Semiconductor devices, Thin films, Aluminum, Ion implantation, Annealing, Radiation effects, Dielectric films.
Identifiers: Charge storage.

The trapping of charge in the amorphous SiO2 layer of metal-oxide-semiconducting devices under ionizing radiation conditions can be modified by implanting the oxide with Al(+) ions. Optical absorption, E.S.R. and MOS capacitance methods have been used to study implantation induced defects in the oxide, the associated change in oxide charge storage and the stability of the defects to post implantation thermal annealing. A simple model of negative charge storage in the implantation zone combined with positive charge storage in the interface regions has been examined. Results of this modeling are discussed. (Author)

AD-785 937/4GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
MECHANISM OF THE OXIDE CATHODE EMISSION CAPACITY CHANGES WITH CURRENT TAKE-OFF.
G. Ya. Pikus, and V. P. Teterya. 24 Dec 73, 8p
Rept no. FSTC-HT-23-1440-73
Trans. of Ukrainskii Fizicheskii Zhurnal (USSR) v17 n3 p472-476 1972.

Descriptors: *Cathodes, Oxides, Barium oxides, Strontium compounds, Emission, Work functions, Translations, USSR.

For an activated cathode based on (Ba,Sr,Ca)O, with a ratio of 50:45:5, the static emission, I sub =, decreased, not because of poisoning, but because of a change in the state of the emitter, due to the take-off current. The decrease in the pulse emission was 5-10 times that in I sub =. Similar results were obtained with pure BaO and SrO. The work function phi = phi sub 0 +(d phi/dT)T for BaO and (Ba,Sr,Ca)O is 1.2 + 0.0006T and 1.5 + 0.00055T eV, resp. The current take-off is associated with an increase in phi, but its change under static conditions does not reflect the true picture of the changes in separate local sections of the oxide layer.

AD-786 038/0GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
EQUIVALENT CIRCUIT PARAMETERS OF MICROWAVE POWER TRANSISTORS AT HIGH INJECTION LEVELS,
I. P. Nikolaevskii, V. V. Polevoi, and E. P. Sorokin. 16 Apr 74, 14p Rept no. FSTC-HT-23-1572-73
Trans. of Poluprovodnikovye Pribory i Ikh Primenenie: Sbornik Statei (USSR) n24 p42-51 1970.

Descriptors: *Junction transistors, Microwave equipment, Circuits, Translations, USSR.
Identifiers: Equivalent circuits.

Circuit parameters are derived for a high-frequency planar drift power transistor. In determining low-signal parameters, the inductances of transistor base, emitter, and collector and the parasitic reactive elements of the measuring circuits are critical.

AD-786 062/0GA PC$5.75/MF$2.25
National Bureau of Standards Boulder Colo Cryogenics Div
HEAT TRANSFER IN PULSED SUPERCONDUCTING MAGNETS.
Final rept. 10 Apr-31 Dec 73,
V. Arp, P. J. Giarratano, R. C. Hess, and M. C. Jones. Aug 74, 140p Rept no. NBSIR-74-363
AFAPL-TR-74-62
Previously announced as COM-74-11053.

Descriptors: *Electromagnets, Superconductors, Heat transfer, Pulses, Helium, Supercritical flow, Liquid helium, Film boiling, Nucleate boiling.
Identifiers: *Superconducting magnets.

The first section of the report summarizes design problems for the development of advanced superconducting pulse magnets, leading to recommendations for future work, primarily in (1) evaluation of eddy-current, hysteresis, and frictional losses, and (2) transient heat transfer between the superconductor and the helium. Two subsequent sections report measurements of forced convection heat transfer respectively to subcooled liquid helium and to supercritical helium just above the critical pressure. (Author)

AD-786 279/0GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
INJECTION ELECTROLUMINESCENCE IN PHOSPHOROUS-ION-IMPLANTED ZNSE P-N JUNCTION DIODES.
Journal article,
Y. S. Park, and B. K. Shin. 5 Oct 73, 5p Rept no. ARL-74-0053
Revision of report dated 23 Jul 73.
Availability: Pub. in Jnl. of Applied Physics, v45 n3 p1444-1446 Mar 74.

Descriptors: *Electroluminescence, *Zinc selenides, *Light emitting diodes, Ion implantation, Phosphorus, Emission spectra.
Identifiers: *Electroluminescent diodes.

Electroluminescence has been obtained from phosphorus-implanted ZnSe p-n junction diodes at room temperature. In forward bias, the diodes exhibit an electroluminescence spectrum similar to the red photoluminescence spectrum with a peak at 6300 A giving an external quantum efficiency of 0.01%. (Author)

COM-74-50888/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE DESIGN OF NEAR-PERFECT INSTRUMENT TRANSFORMERS OF SIMPLE AND INEXPENSIVE CONSTRUCTION.
Final rept.,
Wilbur C. Sze, and F. Ralph Knotter. 1974, 6p
Pub. in Jnl. of Applied Meas., v2 nl p22-27 Jan/Feb 74.

Descriptors: *Instrument transformers, Design.

A brief discussion of the causes of ratio errors in single- and two-stage transformers is presented. The design and construction of two simple two-stage transformers, which can be used in either the voltage or current mode with an accuracy better than 10 ppm in ratios over the frequency band of 50 to 2000 Hz are described. Multiple ratios are obtained by series-parallel interconnections of windings.

N74-29557/7GA PC$11.25/MF$2.25
Technische Hochschule, Hanover (West Germany).
ON THE EFFECT OF FIELD STRENGTH ON THE CONDUCTION MECHANISM IN POLYEHTYLENE UNDER DIRECT AND ALTERNATING VOLTAGES UEBER DEN EINFLUSS DER FELDSTAERKE AUF DEN LEITUNGSMECHANISMUS IN POLYAETHYLEN BEI GLEICH-UND WECHSELSPANNUNG.
Ph.D Thesis.
R. Vonolshausen. 1973, 162p
Language in German.

Descriptors: *Electric field strength, *Electrical resistivity, *Polyethylenes, Alternating current, Conduction bands, Dielectric properties, Direct current, Ohmic dissipation.

For abstract, see STAR 1219

N74-29558/5GA PC$10.00/MF$2.25
Technische Universitaet, Brunswick (West Germany).
METALLIC FOIL USED AS CIRCUIT BREAKER FOR FAST AND HIGH CURRENT COMMUTATION FROM INDUCTIVE STORAGE.
Ph.D. Thesis.
G. Schenk. 1972, 139p
In German; English Summary.

Descriptors: *Circuit breakers, *Commutation, *High current, *Metal foils, Energy transfer, Inductance, Integral equations.

For abstract, see STAR 1219

N74-29563/5GA PC$9.75/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
SIMPLIFIED CUT CORE INDUCTOR DESIGN.
W. T. Mclyman. 1 Jul 74, 131p NASA-CR-139361, JPL-TM-33-697
Contract NAS7-100

Descriptors: *Cores, *Inductors, *Silicon, *Steels, Graphs (Charts), Systems engineering, Tables (Data).

For abstract, see STAR 1219

N74-29565/0GA PC$8.50/MF$2.25
Toulouse Univ. (France).
CONTRIBUTION OF THE STUDY OF METAL-SILICON CONTACT: ELECTRIC HYSTERESIS CONTRIBUTION A L'ETUDE DU CONTACT METALSILICIUM: L'HYSTERESIS ELECTRIQUE.
Ph.D. Thesis.
C. Flassayer. 29 Oct 73, 106p
Language in French.

Descriptors: *Electrical properties, *Hysteresis, *Schottky diodes, Avalanches, Contact resistance, Polarization characteristics.

For abstract, see STAR 1219

N74-29576/7GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
CABLES AND CONNECTORS: A COMPILATION.
Technology Utilization.
1974, 22p NASA-SP-5936(02)

Descriptors: *Cables (Ropes), *Connectors, *Nasa programs, *Technology transfer, *Technology utilization, Conductors, Maintenance, Service life.

For abstract, see STAR 1219

N74-29578/3GA PC$6.50/MF$2.25
General Electric Co., Schenectady, N.Y. Research and Development Center.
DEVELOPMENT AND FABRICATION OF IMPROVED SCHOTTKY POWER DIODES.
Interim Report.
L. F. Cordes, M. Garfinkel, and E. A. Taft. 1974, 69p NASA-CR-134624, SRD-74-024
Contract NAS3-116749

Descriptors: *Electrical engineering, *Electrical properties, *Schottky diodes, High voltages, Performance, Semiconductors (Materials).

For abstract, see STAR 1219

N74-29603/9GA PC$7.75/MF$2.25
Paris Univ. (France).
CONTRIBUTION OF THE STUDY OF RAPID SWITCHING ON INTENSE CURRENTS CONTRIBUTION A L'ETUDE DE L'INTERRUPTION RAPIDE DE COURANTS INTENSES.
Ph.D. Thesis.
A. Delmas. 5 Jun 73, 93p
Language in French.

Descriptors: *Circuit breakers, *High current, *Switching circuits, Circuit diagrams, Electric equipment.

For abstract, see STAR 1219

N74-29978/5GA PC$8.75/MF$2.25
Technische Universitaet, Brunswick (West Germany).
TRACES ON METAL ELECTRODES AFTER VOLTAGE SURGE IN VACUUM DIE SPUREN AUF METALLELEKTRODEN NACH EINEM SPANNUNGSDURCHBRUCH IM VAKUUM.
Ph.D. Thesis.
W. Meister. 1973, 114p
Language in German.

Descriptors: *Electrodes, *Microporosity, *Surges, Bubbles, Cratering, Metal surfaces, Statistical distributions, Surface properties.

For abstract, see STAR 1219

N74-30202/7GA PC$17.00/MF$2.25
Toulouse Univ. (France).
PHYSICAL PROPERTIES OF SI-SIO2 INTERFACES ON THE ACTION OF ELECTRIC CONSTRAINTS PROPRIETES PHYSIQUES DES INTERFACES SI-SIO2 SOUS L'ACTION DE CONTRAINTES ELECTRIQUES.
Ph.D. Thesis.
J. Simonne. 2 Jul 73, 279p
Language in French.

Descriptors: *Circuit diagrams, *Interface stability, *Metal oxide semiconductors, *Physical properties, Avalanches, Charge carriers, Thermodynamic equilibrium.

For abstract, see STAR 1219

N74-30205/0GA PC$9.00/MF$2.25
Technische Universitaet, Munich (West Germany).
NOISE BEHAVIOR OF SEMICONDUCTORS WITH INTERNAL SHOCK IONIZATION MULTIPLICATION DURING SPECTROSCOPY ON LOW ENERGY GAMMA OR X-RAY QUANTA RAUSCHVERHALTEN VON HALBLEITERDETEKTOREN MIT INNERER VERSTAERKUNG DURCH STOSSIONISATION BEI DER SPEKTROSKOPIE VON NIEDERENERGETISCHEN GAMMA ODER ROENTGENQUANTEN.
Ph.D. Thesis.
G. Berg. 1973, 117p
Language in German.

Descriptors: *Nuclear radiation spectroscopy, *Semiconductor devices, *Signal to noise ratios, Gamma rays, Ionization potentials, P-n junctions, Radiation detectors, X ray spectroscopy.

For abstract, see STAR 1219

N74-30208/4GA PC$9.50/MF$2.25
Technische Universitaet, Munich (West Germany).
EFFECTS OF THE ABSORPTION LOCATION OF GAMMA QUANTA ON THE ENERGY DISSIPATION IN DIFFUSED SEMICONDUCTOR DETECTORS WITH INTERNAL REINFORCEMENT EINFLUSS DES ABSORPTIONSORTES VON GAMMA-QUANTEN AUF DIE ENERGIEAUFLOESUNG DIFFUNDIERTER HALBLEITERDETEKTOREN MIT INNERER VERSTAERKUNG.
Ph.D. Thesis.
A. Heuberger. 29 May 73, 126p
Language in German.

Descriptors: *Avalanche diodes, *Gamma rays, *Ionization potentials, *Lattice parameters, *Signal to noise ratios, Charge carriers, Crystal structure, Electron diffusion, Hole distribution (Electronics), Semiconductor devices.

For abstract, see STAR 1219

N74-30449/4GA PC$7.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PERFORMANCE OF FINNED THERMAL CAPACITORS.
Ph.D. Thesis - Texas Univ., Austin.
W. R. Humphries. Jul 74, 324p NASA-TN-D-7690

Descriptors: *Capacitors, *Finned bodies, *Heat storage, Gravitational effects, Performance tests, Spacecraft environments, Thermal environments, Weightlessness.

For abstract, see STAR 1220

N74-30568/1GA PC$8.75/MF$2.25
Technische Universitaet, Brunswick (West Germany).
PRODUCTION AND PROPERTIES OF PLANAR X-BAND GUNN ELEMENTS.
Ph.D. Thesis.
D. Ullrich. 16 Mar 73, 112p

Descriptors: *Emission spectra, *Gallium arsenides, *Gunn diodes, *Planar structures, Production engineering, Signal to noise ratios, Silicon, Transport properties, X rays.

For abstract, see STAR 1220

N74-30571/5GA PC$9.00/MF$2.25
Technische Universitaet, Munich (West Germany).
EFFECT OF AN ADDITIVE GRADIENT ON THE CAPACITY OF A MOS DIODE, ON THE THRESHOLD VOLTAGE OF MOS TRANSISTORS, AND ON THE DETERMINATION OF BOUNDARY LAYER PROPERTIES EINFLUSS EINES DOTIERUNGSGRADIENTEN AUF DIE KAPAZITAET EINER MOS-DIODE, AUF DIE SCHWELLSPANNUNG VON MOS-TRANSISTOREN UND AUF DIE BESTIMMUNG VON GRENZFLAECHENZUSTAENDEN.
Ph.D. Thesis.
H. Feltl. 21 Sep 73, 120p
Language in Georgian.

Descriptors: *Additives, *Metal oxide semiconductors, *Transport properties, Boundary layers, Capacitance, Diodes, Electrical properties, Ion implantation, Junction transistors.

For abstract, see STAR 1220

N74-30572/3GA PC$6.00/MF$2.25
Elektronikcentralen, Hoersholm (Denmark).
PLASTIC CAPACITORS: A QUALITATIVE SURVEY OF 31 FABRICATION TYPES WITH 5 DIFFERENT FORMS OF DIELECTRICS PLASTKONDENSATORER: EN KVALITETSSAMMENLIGNENDE UNDERSOGELSE AF 31 FABRIKATER OG TYPER MED 5 FORSKELLIGE FORMER FOR DIELEKTRIKUM.
U. Fabricius. May 74, 58p ECR-41
In Danish; English Summary.

Descriptors: *Capacitors, *Plastics, *Service life, Dielectric properties, Foils (Materials), Metallizing, Performance tests, Thermal environments.

For abstract, see STAR 1220

N74-31252/1GA PC$7.75/MF$2.25
Elektronikcentralen, Hoersholm (Denmark).
TECHNOLOGICAL ASPECTS OF SEMICONDUCTOR COMPONENTS 1. CHEMICAL AND MECHANICAL DECAPSULATION TECHNIQUES: SIMPLE ANALYTICAL TECHNIQUES, INCLUDING MICROSCOPY, X-

RAYS OR SCANNING OF BONDING STRENGTH, PRACTICAL EXAMPLES TEKNOLOGISK VURDERING AF HALVLEDERKOMPONENTER 1. KEMISK OG MEKANISK DISSEKERINGSTEK-NIK: INDLEDENDE ANALYSETEKNIK, HERUNDER MIKROSKOPI, RONTGEN OG MALING AF BONDINGTRAEKSTYRKER, PRAKTISKE EKSEMPLER.
P. Villien. Apr 74, 91p ECR-40
In Danish; English Summary.

Descriptors: *Chemical attack, *Encapsulating, *Mechanical properties, *Semiconductor devices, Bonding, Electron microscopes, Optical microscopes, X ray analysis.

For abstract, see STAR 1220

PAT-APPL-491 418 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
INTEGRATED STRUCTURE VACUUM TUBE.
Patent Application.
J. Dimeff, and W. J. Kerwin. Filed 24 Jul 74, 18p
NASA-CASE-ARC-10445-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *High temperature environments, *Radiation, *Thin films, *Vacuum tubes, Arrays, *Patent applications, Photoconductors.

High efficiency, multi-dimensional thin film vacuum tubes suitable for use in high temperature, high radiation environments are described. The tubes are fabricated by placing, as by photolithographic techniques, such as are used in solid state integrated circuits, thin film electrode members in selected arrays on facing interior wall surfaces of an alumina substrate envelope. Cathode members are formed using thin films of triple carbonate. The photoresist used in photolithography aids in activation of the cathodes by carbonizing and reacting with the reduced carbonates when heated in vacuum during forming. The finely powdered triple carbonate is mixed with the photoresist used to delineate the cathode locations in the conventional solid state photolithographic manner. Upon high temperature forming 9(1000 C) the barium, etc. is formed at the surface. Anode and grid members are formed using thin films of refractory metal.

PAT-APPL-492 075 PC$3.25/MF$2.25
Department of the Air Force Washington D C
METHOD OF FABRICATING ION IMPLANTED ZNSE P-N JUNCTION DEVICES.
Patent application,
Yoon Soo Park. Filed 26 Jul 74, 24p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Semiconductor diodes, Patents, Fabrication, Ion implantation, Semiconductor junctions, Zinc selenides, Phosphorus, Light emitting diodes, Switching.
Identifiers: *Patent applications, PAT-CL-317-235.

The patent application describes light emitting diodes, switching diodes with memory, and backward diodes fabricated by phosphorus ion implantation of a p-n semiconductor junction in aluminum doped zinc selenide substrate material.

SAND-74-5209 PC$4.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
BALANCING RELIABILITY, COST, AND HARDNESS.
J. A. Hood. Jul 74, 22p CONF-740707-9

Descriptors: (*Semiconductor devices, *Quality control), Cost, Radiosensitivity, Reliability.

For abstract, see NSA 30 08, number 21264.

SLA-73-934 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
CIRCUIT FOR SIMULATING THE LOADING AND OPENING OF BRIDGEWIRES.
W. T. Perea. Oct 73, 8p
Contract AT(29-1)-789

Descriptors: Electric bridges, Switches.

For abstract, see NSA 30 08, number 23478.

SLA-74-5030 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
RADIATION DEGRADATION IN MIXED RADIATION FIELDS.
J. M. McKenzie. 1973, 8p CONF-740632-1

Descriptors: (*Semiconductor devices, *Radiation hardening), Energy dependence, Errors, Field effect transistors, Gamma radiation, Gamma spectra, Neutron dosimetry, Neutron spectra, Neutrons, Physical radiation effects, Simulators.

For abstract, see NSA 30 08, number 21265.

9B. Computers

AAEC/E-312 PC$5.00/MF$2.25
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
DIRECTED-GRAPH SYNTAX ANALYSER FOR THE ACL-NOVA SYSTEM.
P. L. Sanger, and I. J. Hayes. May 74, 36p
U.S. Sales Only.

Descriptors: Computers, Diagrams, Programming languages, Simulation, Translators.

For abstract, see NSA 30 08, number 23290.

AD-785 876/4GA PC$6.25/MF$2.25
Army Computer Systems Command Fort Belvoir Va
MANAGEMENT STRATEGIES FOR ADP NETWORKING.
Final rept.,
K. Roger Moore. 1974, 170p* Rept no. USACSC-AT-74-02

Descriptors: *Data processing terminals, *Logistics planning, *Army, Communications networks, Management information systems, Cost analysis, Economics, Time sharing.
Identifiers: Network analysis(Management), *Computer networks, Benefit cost analysis.

The purpose of this report is to identify the fundamental long range issues affecting the environment in which future Army ADP support must be provided and to discuss the emerging theories of ADP network management. This is one of several reports to be produced by the Multicommand Networks Project. Whereas other reports of this Project will make specific recommendations regarding Army installations, this report establishes a frame of reference broad enough to transcend all the alternatives to be considered. For the purposes of this report, the terms 'computer networking,' 'ADP networking,' and 'ADP consolidation' are considered to be synonymous. In the fullest sense of networking, each organizational element in the network can be a producer, or a consumer of ADP services, or both. (Modified author abstract)

AD-785 943/2GA PC$4.25/MF$2.25
Technology Inc Dayton Ohio
THE ARL LINEAR ALGEBRA LIBRARY HANDBOOK.
Interim technical rept. 1 Sep 73-31 Mar 74,
Paul J. Nikolai, and Nai-kuan Tsao. Jul 74, 67p*
ARL-74-0106
Contract F33615-73-C-4155

Descriptors: *Linear algebra, *Computer programs, Linear algebraic equations, Matrices(Mathematics), Eigenvectors, FORTRAN, Computations, Instruction manuals.
Identifiers: CDC 6000 computers, CDC 7000 computers, Eigenvalues.

The purpose of this report is to provide a companion volume to the ARL Linear Algebra Library. This library is a collection of numerical linear algebra programs written in the FORTRAN language, and developed on the CDC 6000/7000 series processors. The contents of this report feature the machine-printed documentation currently furnished in a machine-readable medium with each program in the library. Included in the library is a comprehensive selection of programs for solving linear algebraic equations and for the determination of eigenvalues and eigenvectors of real symmetric matrices. Unique features of the library include a translation into ANSI FORTRAN of the RITZIT algorithm of H. Rutishauser and the rational QL algorithm of C. Reinsch. (Modified author abstract)

AD-786 061/2GA PC$4.75/MF$2.25
Mitre Corp Bedford Mass
STATISTICAL ANALYSIS TO DETERMINE DIGITAL COMPUTER WORKLOAD CHARACTERISTICS,
J. E. Esposito. Jun 74, 80p Rept no. MTR-2740
ESD-TR-74-175
Contract F19628-73-C-0001

Descriptors: *Digital computers, *Statistical analysis, Data processing, Data management, Accounting, Computer programs.
Identifiers: Workload, Performance evaluation, Histograms.

A real workload of a digital computer is characterized by the magnitude of demands placed on the various system resources. Selected performance variables chosen from these demands can be examined with the purpose of projecting their statistical characteristics onto a synthetically constructed, representative workload. This paper describes a general approach of statistical analysis for representative workload characterization and presents an illustration of this approach using the IBM System Management Facility data. (Author)

AD-786 084/4GA Reprint
California Univ Berkeley
PIPELINING - THE GENERALIZED CONCEPT AND SEQUENCING STRATEGIES,
C. V. Remamoorthy, and K. H. Kim. 1974, 11p
AROD-11343.2-EL
Grants DA-ARO-D-31-124-73-G157, NSF-GJ-35839
Availability: Pub. in AFIPS-Conference proceedings: National Computer Conference, v43 p289-297 1974.

Descriptors: *Computers, Sequences, Parallel processing, Microprogramming, Computations.
Identifiers: *Pipelining(Computers), Computer networks.

In this paper, the authors generalize the concept of pipelining to increase throughput, processing speed, resource utilization and reliability. Its wide application spectrum is demonstrated and major design problems such as sequencing, reconfiguration, etc., are indicated. A scheme called the dynamic sequencing and segmentation model (DSSM) is proposed as a solution for providing efficient sequencing with very low overhead. The model is analyzed under various realistic environments and its performance is evaluated.

AD-786 686/9GA Reprint
California Univ Berkeley
EFFICIENCY IN GENERALIZED PIPELINE NETWORKS,
C. V. Ramamoorthy, and H. F. Li. 1974, 13p
AROD-11343.3-EL
Grants DA-ARO-D-31-124-73-G157, NSF-GJ-35839
Availability: Pub. in AFIPS Conference Proceedings, National Computer Conference, v43 p625-635 1974.

Descriptors: *Parallel processing, Memory devices, Scheduling, Efficiency.
Identifiers: *Pipelining(Computers).

A common architecture of most of today's super machines revolves around parallel or pipeline processing. Typical examples of such machines are the CDC STAR-100, TI-ASC, PEPE, IBM 360/91, 360/195, and CDC 6600, 7600, etc. They all have distinct pipeline processing capabilities, either in the form of internally pipelined arithmetic functional units or in the form of a pipeline of special purpose functional units. The principal idea behind pipelining is to create as much overlap as possible in the operations of the different facilities, for example, memory fetch unit, decoding units, adders, and multipliers.

AD-786 133/9GA PC$5.75/MF$2.25
Bolt Beranek and Newman Inc Cambridge Mass
THE INTERFACE MESSAGE PROCESSOR PROGRAM.
Feb 73, 134p* Rept no. Technical Information-89
Contracts DAHC15-69-C-0179, F08606-73-C-0027
Supersedes Rept. no. AD-781 466.

Descriptors: *Communications networks, *Computer programming, Data processing terminals, Message processing, Control sequences.
Identifiers: IMP(Interface Message Processors), *Interface message processors, *ARPA computer network, *Computer networks.

Implementation of the IMPs required the development of a sophisticated computer program. This program has been previously described. As stated then, the principal function of the IMP program is the processing of packets, including the following: segmentation of Host message into packets; receiving, routing, and transmitting store-and-forward packets; retransmitting unacknowledge packets; reassembling packets into messages for transmission into a Host; and generating RFNMs and other control messages. The program also monitors network status, gathers statistics, and performs on-line testing.

AD-786 134/7GA PC$4.75/MF$2.25
Bolt Beranek and Newman Inc Cambridge Mass
THE NETWORK CONTROL CENTER PROGRAM.
Feb 73, 90p* Rept no. Technical Information-90
Contracts DAHC15-69-C-0179, F08606-73-C-0027
Supersedes Rept. no. AD-777 752.

Descriptors: *Communications networks, *Computer programming, Message processing, Data processing terminals, Statistical analysis.
Identifiers: IMP(Interface Message Processors), *Interface message processors, *ARPA computer network, *Computer networks, NCC computer program.

This report describes the Network Control Center (NCC) program used in the Advanced Research Projects Agency (ARPA) Network. The information in this report will introduce programmers to the functions and fundamental structure of the NCC program. A diagram showing the format of IMP-NCC messages has been included and other major data entities are discussed. A program listing and concordance are included as attachments and a guide to NCC operations has been appended to the report.

AD-786 135/4GA PC$7.25/MF$2.25
Bolt Beranek and Newman Inc Cambridge Mass
THE TERMINAL INTERFACE MESSAGE PROCESSOR PROGRAM.
Aug 73, 214p* Rept no. Technical Information-91
Contracts DAHC15-69-C-0179, F08606-73-C-0027
Supersedes Rept. no. AD-781 459.

Descriptors: *Communications networks, *Computer programming, Data processing terminals, Message processing, Memory devices, Control sequences.
Identifiers: IMP(Interface Message Processors), *Interface message processors, ARPA computer network, Computer networks, TIP computer program.

Contents: Overview of the Terminal IMP hardware; software summary; performance summary; summary of protocol design decisions and protocol deviations; references and TIP bibiliography; storage layout; data structures; detailed software description; TIP site configuration macros; TIP concordance; TIP listing; TIP mag tape option listing.

AD-786 172/7GA PC$3.75/MF$2.25
Illinois Univ Urbana Center for Advanced Computation
SEMIANNUAL TECHNICAL REPORT, 1 OCT 73-31 MAR 74,
D. L. Blotnick. 31 Mar 74, 29p Rept no. UIUC-CAC-DN-74-119
Contract DAHC04-72-C-0001, ARPA Order-1899
See also AD-772 511. Report on ILLIAC IV Applications Research.

Descriptors: *Data processing, Reports, Parallel processing, Pattern recognition, Image processing, Linear programming, Approximation, Networks.
Identifiers: ILLIAC 4 computer, ARPA computer network.

This is a progress report on ARPA contract DAHC04-72-C-0001, entitled, 'ILLIAC 4 Applications Research at the Center for Advanced Computation, University of Illinois at Urbana-Champaign.' During this period there was research in the following areas: (1) Applied mathematics, (2) Pictorial pattern information processing, (3) Distributed computer systems, and (4) Network terminal systems.

AD-786 176/8GA PC$5.75/MF$2.25
University of Southern California Los Angeles Image Processing Inst
IMAGE PROCESSING RESEARCH.
Technical semiannual rept. 1 Mar-31 Aug 74,
William K. Pratt. 30 Sep 74, 130p* Rept no. USCIPI-540
Contract F08606-72-C-0008, ARPA Order-1706
See also report dated 31 Mar 74, AD-779 332.

Descriptors: *Image processing, *Pattern recognition, Coding, Pulse code modulation, Quantization, Pictures, Optical images, Colors, Data transmission systems, Television systems, Real time, Fourier transformation, Computer programming.
Identifiers: Feature extraction, Image enhancement.

The research program has as its primary purpose the analysis and development of techniques and systems for efficiently generating, processing, transmitting, and displaying visual images and two dimensional data arrays. Research is oriented toward digital processing and transmission systems. Five task areas are reported on: (1) Image Coding Projects: the investigation of digital bandwidth reduction coding methods; (2) Image Restoration and Enhancement: the improvement of image fidelity and presentation format; (3) Image Data Extraction Projects: the recognition of objects within pictures and quantitative measurement of image features; (4) Image Analysis Projects: the development of quantitative measures of image quality and analytic representation; (5) Image Processing Support Projects: development of image processing hardware and software support systems. (Modified author abstract)

AD-786 224/6GA PC$3.25/MF$2.25
Probe Consultants Inc Phoenix Ariz
PROGRAM REDUCTION IN THE PILER SYSTEM.
Progress rept.,
Penny Barbe. 1 Jan 74, 13p Rept no. PLR-010
Contract N00014-67-C-0472

Descriptors: *Computer programming, Translators, Mathematical logic.
Identifiers: *PILER system, Translator routines, Logic design.

The PILER System is an automatic translating system which creates an operational program for a target computer, using a program operable on a source computer for problem definition. The purpose of program reduction, as implemented in the PILER Analyzer, is to reduce the subject program to logic essentials divorced from source computer environment. Part of program reduction is the determination of the significant commands and effects, and the elimination of the superfluous commands and actions. This paper describes technical details of the Condition Analyzer and Register Usage Analyzer in the Piler Analyzer. (Modified author abstract)

AD-786 225/3GA PC$3.25/MF$2.25
Probe Consultants Inc Phoenix Ariz
THE FLOW CHART PRODUCED BY THE PILER SYSTEM.
Progress rept.,
Penny Barbe. 1 Jul 74, 15p Rept no. PLR-011
Contract N00014-67-C-0472

Descriptors: *Computer programming, *Flow charting, Translators, Mathematical logic, Interfaces.
Identifiers: *PILER system, Translatior routines.

The PILER System is an automatic translating system which creates an operational program for a target computer, using a program operable on a source computer for problem definition. At the end of the second stage of the translation process, the Analyzer run, a flow chart of the subject program is produced along with a description of the data used in the original version of the subject program. The flow chart may be the end product of a PILER run, providing uniform documentation of programs. It may be used to check that the Analyzer properly interpreted the subject program. (Modified author abstract)

AEC/SNS-3060-009 PC$7.00/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
CONPLOT: A GENERAL PURPOSE CONTOUR PLOTTING PROGRAM.
J. T. Stadter, and R. O. Weiss. Jun 74, 78p ANSP-M-9

Descriptors: (*Computer codes, *C codes), Display devices, Distribution, Finite element method, Manuals, Plotters, Programming languages, Reentry, Shape, Size, Specifications, Variations.

For abstract, see NSA 30 08, number 23291.

ANL-8103 PC$4.00/MF$2.25
Argonne National Lab., Ill.
COPYCAT: OS CATALOG UTILITY PROGRAM.
D. E. Engert. May 74, 18p
Contract W-31-109-eng-38

Descriptors: (*Computer codes, *C codes), Data processing, Efficiency, Information retrieval, Management, Programming, Tables.

For abstract, see NSA 30 08, number 23292.

CEA-N-1696 PC$4.25/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Service d'Electronique Physique.
FAST SAMPLING AR 100 SYSTEM.
1 Jan 74, 23p
In French. U.S. Sales Only.

Descriptors: (*Data acquisition systems, *Specifications), Camac system, Display devices, Readout systems.

For abstract, see NSA 30 08, number 23294.

COM-74-11572/6GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
COMPUTER NETWORKS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1969-Sep 74,
Douglas Craig, and David Grooms. Oct 74, 169p*
NTIS/WIN-74/081
Supersedes COM-73-11977.

Descriptors: *Bibliographies, *Computer networks, Computer programming, Computer systems hardware, Time sharing, Queueing theory, Scheduling, Mathematical models.
Identifiers: ARPA computer network, IMP(Interface Message Processors), Interface message precessors.

The NTISearch bibliography contains 153 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The report covers all aspects of computer networks including hardware, software, data transmission, time sharing, and applicable theory to network design.

COM-74-50838/3GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C.
SOFTWARE SUMMARY FOR DESCRIBING COMPUTER PROGRAMS AND AUTOMATED DATA SYSTEMS.
Federal information processing standards.
30 Jun 74, 9p FIPS-Pub-30
Paper copy available from GPO $0.20.

Descriptors: *National government, *Data processing, *Computer programming, *Standards.
Identifiers: *Federal information processing standards.

This publication provides a standard software summary form (SF-185) together with instructions for describing computer programs and/or automated data systems for identification, reference, and dissemination purposes. Federal Information Processing Standard Software Summary Form (SF-185) will be used in documenting summaries or abstracts of programs and/or automated data systems that are developed or acquired by Federal departments and agencies. This form will also be used by the General Services Administration in the establishment of a centralized registry of selected government software.

COM-74-50839/1GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C. Systems and Software Div.
A TECHNICAL GUIDE TO COMPUTER-COMMUNICATIONS INTERFACE STANDARDS.
Technical note,
Albrecht J. Neumann, Brian G. Lucas, Justin C. Walker, and Dennis W. Fife. Aug 74, 114p NBS-TN-843
Library of Congress Catalog Card no. 74-600131.
Sponsored in part by Defense Communications Agency, Reston, Va. Joint Technical Support Activity.
Paper copy available from GPO $1.50.

Descriptors: *Global communication, *Data processing terminals, *Telecommunication, *Interfaces, *Standards, Data transmission, Control sequences, Handbooks.
Identifiers: *Computer networks, *Communications networks.

A technical summary and guide is given for existing and forthcoming Federal and National standards on data communications pertinent to computer networking. Selected international standards and industry practices are included for completeness. Prepared to assist the application of standards within the World Wide Military Command and Control System, this handbook should be useful to all ADP system designers interested in uniform data terminal interfaces, character sets and codes, keyboard arrangements, and communications line disciplines for effective message exchange between computers.

COM-74-50840/9GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
APPROACHES TO PRIVACY AND SECURITY IN COMPUTER SYSTEMS. PROCEEDINGS OF A CONFERENCE HELD AT THE NATIONAL BUREAU OF STANDARDS, ON MARCH 4-5, 1974.
Special pub. (Final),
Clark R. Renninger. Sep 74, 86p NBS-SP-404
Paper copy available from GPO $1.20.

Descriptors: *Computers, *Data processing, *Security, *Meetings, Protection.
Identifiers: *Computer information security, *Computer privacy, *Data processing security, Computer networks.

This publication summarizes and contains the proceedings of a conference held at the National Bureau of Standards on March 4-5, 1974 to continue the dialog in search of ways to protect confidential information in computer system. Proposals are presented for meeting governmental needs in safeguarding individual privacy and data confidentiality that were identified at a conference held in November 1973. Among the proposals are the enactment of privacy legislation, improved computer system architecture and access controls, information and security management guidelines and the development of a systematic, balanced approach to system security. The proposals were presented by legislators, citizens, computer industry associations and companies, professional societies, and public interest groups.

COM-74-50878/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ASCII CODE APPLICATIONS TO ALPHANUMERIC DISPLAY TERMINALS.
Final rept.,
John L. Little. 1973, 6p
Pub. in Proceedings of the Society for Information Display Terminals, Gaithersburg, Md., 30 Nov-1 Dec 71, v14 n2 2nd qtr p67-72 1973.

Descriptors: *Data processing terminals, *Display devices, Cathode ray tubes.
Identifiers: *Alphanumeric displays.

This paper reviews briefly the evolution of the American Standard Code for Information Interchange (ASCII) and its international version (ISO R-646). It also reviews the evolutionary impact of typewriters, teletypewriters and the ASCII code on conventions now employed in alphanumeric display terminals. It shows a proposed keyboard layout, some approved graphic subsets of ASCII, and some codes used in computers. Current developments in the representation of extended versions of ASCII in 7 and 8 bits are given. Proposed standards for control functions for alphanumeric display terminals are also included, with a warning that their standardization is under the jurisdication of the American National Standards Institute's Technical Committee X3L2 on Character Codes.

COM-74-50925/8GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C. Systems and Software Div.
A TECHNICAL GUIDE TO COMPUTER-COMMUNICATIONS INTERFACE STANDARDS.
Technical note,
Albrecht J. Neumann, Brian G. Lucas, Justin C. Walker, and Dennis W. Fife. Aug 74, 124p NBS-TN-843
Sponsored in part by Defense Communications Agency, Arlington, Va. Library of Congress Catalog Card Number 74-600131.
Paper copy available from GPO $1.50 as C13.46:843.

Descriptors: *Data transmission, *Computers, *Interfaces, *Standards, Data processing terminals, Telecommunication, Signal processing.
Identifiers: *Computer networks, *Communications networks.

A technical summary and guide is given for existing and forthcoming Federal and National standards on data communications pertinent to computer networking. Selected international standards and industry practices are included for completeness. Prepared to assist the application of standards within the World Wide Military Command and Control System, this handbook should be useful to all ADP system designers interested in uniform data terminal interfaces, character sets and codes, keyboard arrangements, and communications line disciplines for effective message exchange between computers.

COM-74-50926/6GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
COST ANALYSIS FOR COMPUTER COMMUNICATIONS.
Final technical note Jul-Oct 73,
Robert P. Blanc. Sep 74, 40p NBS-TN-845
Grant NSF-AG-350
Library of Congress Catalog Card No. 74-600140.
Paper copy available from GPO $0.75.

Descriptors: *Data transmission, *Data processing terminals, *Cost analysis, Telecommunication, Rates(Costs).
Identifiers: *Computer networks, *Communications networks, ARPA computer network.

This report summarizes a communication cost study relevant to the needs of the NSF Networking for Science Program. The primary purpose of this report is to provide an approximation to the communications costs of connecting a specified number of host computers in selected locations with a specified number of interactive user terminals. Cost factors from existing, proposed, and modeled value-added networks are applied to hypothetical traffic demands to arrive at cost estimates.

COM-74-50931/6GA PC-GPO/MF$2.25-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Computer Sciences and Technology.
COMPUTER PERFORMANCE EVALUATION. PROCEEDINGS OF THE MEETING OF COMPUTER PERFORMANCE EVALUATION USERS GROUP (CPEUG) (8TH) HELD IN GAITHERSBURG, MD., ON DECEMBER 4-7, 1973. SPONSORED BY ARMY COMPUTER SYSTEMS COMMAND, FORT BELVOIR, VA. AND NATIONAL BUREAU OF STANDARDS, WASHINGTON, D.C. INST. FOR COMPUTER SCIENCES AND TECHNOLOGY.
Special pub.(Final),
Harold Joseph Highland. Sep 74, 152p NBS-SP-401
Library ofCongress Catalog Card no. 74-13113.
Paper copy available from GPO $1.80.

Descriptors: *Computers, *Performance evaluation, Scheduling, Time sharing, Multiprogramming, Multiprocessing, Operating systems(Computers), Computer systems hardware, Meetings.
Identifiers: Benchmark routines.

The Eighth Meeting of the Computer Performance Evaluation Users Group (CPEUG), sponsored by the United States Army Computer Systems Command and the National Bureau of Standards, was held December 4-7, 1973 at NBS, Gaithersburg. Among the papers presented were those dealing with hardware and software monitors, workload definition and benchmarking, a report of FIPS Task Force 13, computer scheduling and evaluation in time-sharing as well as MVT environment, human factors in performance analysis, dollar effectiveness in evaluation, simulation techniques in

hardware allocation, a FEDSIM status report as well as other related topics.(Modified author abstract)

COO-2383-0010 PC$6.75/MF$2.25
Illinois Univ., Urbana Dept. of Computer Science.
PLW COMPILER.
W. Vanmelle, and L. Lopez. Jul 74, 72p
UIUCDCS-R-74-664
Contract AT(11-1)-2383

Descriptors: Comparative evaluations, Design, Programming languages, Translators.

For abstract, see NSA 30 08, number 23295.

COO-2383-0011 PC$5.75/MF$2.25
Illinois Univ., Urbana.
SOFTWARE SYSTEMS RESEARCH. PROGRESS REPORT, SEPTEMBER 1, 1973–JULY 15, 1974.
C. W. Gear, and D. S. Watanabe. 1974, 52p
Contract AT(11-1)-2383

Descriptors: (*Computer codes, *Research programs), Computers, Differential equations, Errors, Integral equations, Programming, Stability.

For abstract, see NSA 30 08, number 23296.

HMI-B-147 PC$4.00/MF$2.25
Hahn-Meitner-Institut fuer Kernforschung Berlin G.m.b.H. (F.R. Germany). Bereich Datenverarbeitung und Elektronik.
RMON: TASK MANAGEMENT FOR SIEMENS COMPUTER S 301.
K. H. Degenhardt, and W. Woletz. May 74, 19p
In German. U.S. Sales Only.

Descriptors: (*Computers, *Operation), Computer codes, Management, Monitoring, Real time systems.

For abstract, see NSA 30 08, number 23297.

IS-T-637 PC$8.50/MF$2.25
Ames Lab., Iowa.
META-T COMPILER--COMPILER.
A. P. Lucido. Jul 74, 108p
Contract W-7405-eng-82

Descriptors: Automation, Computer codes, Data processing, Design, Errors, Programming languages, Translators.

For abstract, see NSA 30 08, number 23300.

IS-T-641 PC$9.75/MF$2.25
Ames Lab., Iowa.
SOFTWARE ORGANIZATION FOR THE CONTROL OF MULTIPLE PROCESSES.
J. H. Campbell. May 74, 133p
Contract W-7405-eng-82

Descriptors: (*Computer codes, *Organizing), Communications, Computers, Data acquisition, Data processing, Interactions, Pl-1 language, Programming languages.

For abstract, see NSA 30 08, number 23301.

JAERI-M-5572 PC$4.50/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
DATA TRANSFER SYSTEM FROM TMC-4096 CHANNEL ANALYZER TO USC-3 COMPUTER.
Y. Kawarasaki, T. Shoji, and M. Mizumoto. Feb 74, 27p
In Japanese. U.S. Sales Only.

Descriptors: (*Multi-channel analyzers, *Data acquisition systems), Computers, Data transmission, Equipment interfaces, Magnetic tapes, Recording systems.

For abstract, see NSA 30 08, number 23305.

KFK-PDV-17 PC$7.00/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
COMPARISON OF REDUNDANCY REDUCTION ALGORITHMS WITH RESPECT TO SYSTEM PROTECTION USING PROCESS CONTROLLERS.
R. F. W. Grimm. Feb 74, 80p
In German. U.S. Sales Only.

Descriptors: Algorithms, Automation, Comparative evaluations, Computer codes, Computers, Control, Control systems, Data acquisition, Errors.

For abstract, see NSA 30 08, number 23309.

KFK-PDV-19 PC$4.50/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
HUMAN OPERATOR CHARACTERISTICS AND CAPABILITIES IN PERFORMING PROCESS CONTROL TASKS.
K. Etschberger, and R. Zimmermann. Jan 74, 27p
In German. U.S. Sales Only.

Descriptors: Automation, Computers, Control, Control systems, Monitoring, Personnel.

For abstract, see NSA 30 08, number 23310.

KFK-PDV-20 PC$5.50/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
VISUAL DISPLAY SYSTEMS FOR USE IN PROCESS CONTROL CONSOLES.
K. Etschberger, and R. Zimmermann. Jan 74, 47p
In German. U.S. Sales Only.

Descriptors: Control, Control systems, Display devices.

For abstract, see NSA 30 08, number 23311.

KFK-PDV-21 PC$6.25/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
METHODS OF DETECTING AND LOCATING FAULTS OF COMBINATORIAL AND SEQUENTIAL CIRCUITS.
H. D. Hoelzer, H. Roeck, and J. Waidelich. Mar 74, 61p
In German. U.S. Sales Only.

Descriptors: (*Digital systems, *Quality control), (*Electronic circuits, Quality control), Accuracy, Automation, Testing.

For abstract, see NSA 30 08, number 23312.

KFK-PDV-22 PC$6.00/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
RECOGNITION OF SYMBOLS ON VISUAL DISPLAYS (RECOMMENDATIONS FOR EQUIPMENT DESIGNERS).
R. Moog. Mar 74, 56p
In German. U.S. Sales Only.

Descriptors: Computer graphics, Design, Display devices, Images, Information, Recommendations.

For abstract, see NSA 30 08, number 23313.

KFK-PDV-23 PC$8.75/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
APPLICATIONS FOR PROGRAMMABLE EXTERNAL MODULES IN COMPUTERIZED PROCESS CONTROL SYSTEMS.
W. Becker, P. Boese, G. Faerber, H. Guenther, and H. Kalis. May 74, 112p
In German. U.S. Sales Only.

Descriptors: Accuracy, Analog systems, Computers, Control, Data processing, Digital systems, Economics, Efficiency, Reliability.

For abstract, see NSA 30 08, number 23314.

KFK-PDV-24 PC$4.00/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
ANALYSIS OF REQUIREMENTS FOR VISUAL DISPLAYS AND ASSOCIATED CONTROLS.
R. Zimmermann. Apr 74, 20p
In German. U.S. Sales Only.

Descriptors: Control, Data processing, Display devices, Specifications.

For abstract, see NSA 30 08, number 23315.

KFK-1972 PC$5.75/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Datenverarbeitung in der Technik.
MODELS FOR ESTIMATION OF MESSAGE DELAYS IN COMPUTER NETWORKS.
R. Senger. Apr 74, 51p
In German. U.S. Sales Only.

Descriptors: (*Computers, *Performance), Analytical solution, Communications, Forecasting, Mathematical models, Simulation.

For abstract, see NSA 30 08, number 23308.

LA-5613-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
AYER HEAT CONDUCTION COMPUTER PROGRAM.
R. G. Lawton. May 74, 27p
Contract W-7405-eng-36

Descriptors: (*Computer codes, *A codes), (*Thermal conductivity, Computer codes), Axial symmetry, Computers, Finite element method, Temperature dependence, Time dependence, Two-dimensional calculations, Velocity.

For abstract, see NSA 30 08, number 23317.

NASA-SP-5956(01) PC$3.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
AUTOMATIC CONTROLS AND REGULATORS. A COMPILATION.
33p

Descriptors: Automation, Control systems.

For abstract, see NSA 30 08, number 23470.

N74-29528/8GA PC$8.75/MF$2.25
Vanzetti Infrared and Computer Systems, Inc., Canton, Mass.
DESIGN, TESTING, AND DELIVERY OF AN INTERACTIVE GRAPHICS DISPLAY SUBSYSTEM.
Final Report.
B. Holmes. 14 Sep 73, 113p NASA-CR-120334
Contract NAS8-28436

Descriptors: *Computer graphics, *Computer systems design, *Display devices, Infrared scanners, Input/output routines, Television cameras.

For abstract, see STAR 1219

N74-29529/6GA PC$4.75/MF$2.25
Michigan Univ., Ann Arbor.
ON-LINE DIAGNOSIS OF UNRESTRICTED FAULTS.
J. F. Meyer, and R. J. Sundstrom. 1974, 35p
NASA-CR-139375
Contract NGR-23-005-622

Descriptors: *Computer techniques, *Error detection codes, *On-line programming, Computer systems design, Mathematical models.

For abstract, see STAR 1219

N74-29532/0GA PC$4.00/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ON THE RECOGNITION OF COMPLEX STRUCTURES: COMPUTER SOFTWARE USING ARTIFICIAL INTELLIGENCE APPLIED TO PATTERN RECOGNITION.
Y. Yakimovsky. 1 May 74, 13p NASA-CR-139363, JPL-TM-33-693
Contract NAS7-100

Descriptors: *Artificial intelligence, *Computer programs, *Pattern recognition, Information theory, Photography.

For abstract, see STAR 1219

N74-29533/8GA PC$7.75/MF$2.25
Alabama Univ., University. Communication Systems Group.
DESIGN OF FIR DIGITAL FILTERS FOR PULSE SHAPING AND CHANNEL EQUALIZATION USING TIME-DOMAIN OPTIMIZATION.
Final Report.
R. C. Houts, and G. L. Vaughn. May 74, 92p NASA-CR-120340, BER-167-102
Contract NAS8-20172

Descriptors: *Algorithms, *Digital filters, *Pulse amplitude modulation, Fast fourier transformations, Telecommunication.

For abstract, see STAR 1219

N74-29534/6GA PC$11.75/MF$2.25
Eidgenossische Technische Hochschule, Zurich (Switzerland).
COMPUTER AIDED SYNTHESIS OF DIGITAL FILTERS IN THE FREQUENCY DOMAIN.
Ph.D. Thesis.
A. G. Deczky. 1973, 174p REPT-4980

Descriptors: *Computerized design, *Digital filters, *Recursive functions, Algorithms, Chebyshev approximation, Problem solving, Transformations.

For abstract, see STAR 1219

N74-29535/3GA PC$11.25/MF$2.25
Michigan Univ., Ann Arbor. Systems Engineering Lab.
ON-LINE DIAGNOSIS OF SEQUENTIAL SYSTEMS, 2.
R. J. Sundstrom. Jul 74, 163p NASA-CR-139372, UMICH-012146-1-T
Contract NGR-23-005-622

Descriptors: *Failure analysis, *On-line programming, *Sequential computers, Computer systems design, Error detection codes, Logic circuits, Numerical control, Reliability engineering.

For abstract, see STAR 1219

N74-29536/1GA PC$12.50/MF$2.25
Intermetrics, Inc., Cambridge, Mass.
HAL/S PROGRAMMER'S GUIDE.
P. M. Newbold, and R. L. Hotz. 3 Jul 74, 190p NASA-CR-134371, IR-63-3
Contract NAS9-13864

Descriptors: *Programming languages, *Space shuttles, *User manuals (Computer programs), Compilers, Computer programming.

For abstract, see STAR 1219

N74-29537/9GA PC$8.75/MF$2.25
Electrotechnical Lab., Tokyo (Japan).
A SURVEY AND EVALUATION OF INNOVATIVE COMPUTER ARCHITECTURES.
H. Iizuka, K. Fujii, T. Yuba, and T. Shimada. Feb 74, 115p CIRC-179
In English and Japanese.

Descriptors: *Computer systems design, *Computer techniques, Integrated circuits, Microprogramming, Transistors, Vacuum apparatus.

For abstract, see STAR 1219

N74-29538/7GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
USERS GUIDE FOR INFORMATION RETRIEVAL USING APL.
A. Shapiro. Aug 74, 18p NASA-TM-X-69914, NSSDC-74-11

Descriptors: *Information retrieval, *Programming languages, *User manuals (Computer programs), Data bases, Real time operation.

For abstract, see STAR 1219

N74-29539/5GA PC$7.25/MF$2.25
Intermetrics, Inc., Cambridge, Mass.
HAL/S-FC COMPILER SYSTEM FUNCTIONAL SPECIFICATION.
24 Jul 74, 81p NASA-CR-134372, IR-59-4
Contract NAS9-13864

Descriptors: *Compilers, *Data transmission, Coding, Optimization, Run time (Computers), Systems analysis.

For abstract, see STAR 1219

N74-29540/3GA PC$15.00/MF$2.25
TRW Systems Group, Houston, Tex.
HOUSTON OPERATIONS PREDICTOR/ESTIMATOR (HOPE) PROGRAMMING MANUAL, VOLUME 1.
J. K. Daly. 25 Jan 74, 236p NASA-CR-134368, TRW-25990-H004-R0-00-VOL
Contract NAS9-13834

Descriptors: *Computer programming, *Spacecraft orbits, *User manuals (Computer programs), Apollo flights, Data processing, Postflight analysis, Univac 1108 computer.

For abstract, see STAR 1219

N74-29542/9GA PC$5.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A REAL-TIME DIGITAL COMPUTER PROGRAM FOR THE SIMULATION OF A SINGLE ROTOR HELICOPTER.
J. A. Houck, L. H. Gibson, and G. G. Steinmetz. Jun 74, 164p NASA-TM-X-2872, L-9002

Descriptors: *Computer programs, *Digital simulation, *Real time operation, *Sikorsky whirlwind helicopter, Computerized design, Helicopter design, Mathematical models.

For abstract, see STAR 1219

N74-29543/7GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPUTER PROGRAMS FOR CALCULATION OF MATRIX STABILITY AND FREQUENCY RESPONSE FROM A STATE-SPACE SYSTEM DESCRIPTION.
R. C. Seidel. Jul 74, 23p NASA-TM-X-71581, E-8016

Descriptors: *Computer programs, *Computer techniques, *Equations of motion, *Equations of state, Applications of mathematics, Laplace transformation, Matrices (Mathematics), Numerical analysis.

For abstract, see STAR 1219

N74-29545/2GA PC$5.25/MF$2.25
Maryland Univ., College Park. Computer Science Center.
GLOBAL PARALLEL UNIFICATION FOR LARGE QUESTION-ANSWERING SYSTEMS.
J. G. Auguston, and J. Minker. Jun 74, 43p NASA-CR-139212, TR-307
Contract NGR-21-002-270

Descriptors: *Data processing, *Data systems, *Parallel processing (Computers), Algorithms, Computer programming, Data storage, Heuristic methods, Theorem proving.

For abstract, see STAR 1219

N74-30024/5GA PC$11.75/MF$2.25
Toulouse Univ. (France).
CONTRIBUTION OF THE NOTION OF BOOLEAN DIFFERENCE AND ITS APPLICATION TO DIAGNOSTIC LOGIC CONTRIBUTION A L'ETUDE DE LANOTION DE DIFFERENCE BOOLEENNE ET A SES APPLICATIONS AU DIAGNOSTIC LOGIQUE.
Ph.D. Thesis.
J. Erceau. 1973, 171p
Language in French.

Descriptors: *Boolean algebra, *Electrical faults, *Logic circuits, *Sequential analysis, Bibliographies, Circuit diagrams, Computer programs, Theorem proving.

For abstract, see STAR 1219

N74-30025/2GA PC$10.75/MF$2.25
Toulouse Univ. (France).
CONTRIBUTION OF THE MINIMIZATION OF LOGIC FUNCTIONS CONTRIBUTION A LA MINIMISATION DES FONCTIONS LOGIQUES.
Ph.D. Thesis.
J. C. Torque. 1973, 152p
Language in French.

Descriptors: *Boolean functions, *Logic circuits, *Network synthesis, *Switching circuits, Algorithms, Sequential analysis.

For abstract, see STAR 1219

N74-30547/5GA PC$12.75/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
AUTOMATIC DESIGN OF DIGITAL SYSTEMS.
Ph.D. Thesis.
J. Hoogeveen. 14 Sep 73, 192p
In Dutch; English Summary.

Descriptors: *Computerized design, *Digital systems, *Programming languages, Computerized simulation, Digital computers, Logic circuits, Systems engineering.

For abstract, see STAR 1220

N74-30551/7GA PC$4.50/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
GSE, DATA MANAGEMENT SYSTEM PROGRAMMERS/USER' MANUAL.
R. A. Schlagheck, B. D. Dolerhie, Jr., and F. J. Ghiglieri. Jun 74, 110p NASA-TM-X-64862

Descriptors: *Data management, *Ground support equipment, Classifying, Data processing, Mechanical properties, User manuals (Computer programs).

For abstract, see STAR 1220

N74-30552/5GA PC$10.50/MF$2.25
Alabama Univ., University. Bureau of Engineering Research.
A FAST-INITIALIZING DIGITAL EQUALIZER WITH ON-LINE TRACKING FOR DATA COMMUNICATIONS.
Final Report.
R. C. Houts, and W. J. Barksdale. May 74, 146p
NASA-CR-120312, TR-166-102
Contract NAS8-20172

Descriptors: *Data processing, *Equalizers (Circuits), *Intersymbolic interference, *On-line programming, Computer techniques, Error correcting devices, Matrices (Mathematics), Telecommunication.

For abstract, see STAR 1220

N74-30553/3GA PC$5.25/MF$2.25
Michigan Univ., Ann Arbor. Dept. of Computer and Communication Sciences.
CONVERGENCE PROPERTIES OF SIMPLE GENETIC ALGORITHMS.
A. D. Bethke, B. P. Zeigler, and D. M. Strauss. Jul 74, 44p NASA-CR-139560, TR-159
Contract NGR-23-005-602

Descriptors: *Algorithms, *Convergence, *Genetics, Analysis (Mathematics), Computer programming, Hyperplanes, Mathematical logic, Parameterization.

For abstract, see STAR 1220

N74-30554/1GA PC$5.50/MF$2.25
International Business Machines Corp., Huntsville, Ala. Federal Systems Div.
BASIC MEMORY MODULE.
Final Report.
F. C. Tietze. 30 Jun 74, 48p NASA-CR-120392, IBM-74-585-006
Contract NAS8-30460

Descriptors: *Computer storage devices, *Electrical properties, *Random access memory, Chips, Computer components, Electronic modules, Systems engineering.

For abstract, see STAR 1220

PAT-APPL-495 022 PC$4.50/MF$2.25
National Aeronautics and Space Administration. Pasadena Office, Calif.
COMPUTER INTERFACE SYSTEM.
Patent Application.
Filed 5 Aug 74, 26p NASA-CASE-NPO-13428-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Data systems, *Logic circuits, Clocks, Electromagnetic noise, *Patent applications, Signal processing, Stroboscopes.

An interface logic circuit permitting the transfer of information between two computers having asynchronous clocks is disclosed. The information transfer involves utilization of control signals (including request, return-response, ready) to generate properly timed data strobe signals. Noise problems are avoided because each control signal, upon receipt, is verified by at least two clock pulses at the receiving computer. If control signals are verified, a data strobe pulse is generated to accomplish a data transfer. Once initiated the data strobe signal is properly completed independently of signal disturbances in the control signal initiating the data strobe signal. Completion of the data strobe signal is announced by automatic turn-off of a return-response control signal.

PB-235 283/9GA PC$7.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Project MAC.
THE COMPLEXITY OF DECISION PROBLEMS IN AUTOMATA THEORY AND LOGIC.
Larry J. Stockmeyer. Jul 74, 221p MAC-TR-133
NSF/OCA-GJ34671-TR-133
NSF-GJ-34671

Descriptors: *Automata theory, *Mathematical logic, *Decision theory, Turing machines, Boolean algebra, Computation, Recursive functions, Arithmetic, Theses.
Identifiers: MAC project, *Computational complexity.

The inherent computational complexity of a variety of decision problems in mathematical logic and the theory of automata is analyzed in terms of Turing machine time and space and in terms of the complexity of Boolean networks. The problem of deciding whether a star-free expression (a variation of the regular expressions of Kleene used to describe languages accepted by finite automata) defines the empty set is shown to require time and space exceeding any composition of functions exponential in the length of expressions. In particular, this decision problem is not elementary-recursive in the sense of Kalmar. The emptiness problem can be reduced efficiently to decision problems for truth or satisfiability of sentences in the first order monadic theory of (N,<), the first order theory of linear orders, and the first order theory of two successors and prefix, among others. It follows that the decision problems for these theories are also not elementary-recursive. (Modified author abstract)

PB-235 292/0GA PC$3.25/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
PRELIMINARY THOUGHTS ON DEGREES OF SECURITY IN MULTIPROCESSOR SYSTEMS.
Final rept.,
Clarence A. Ellis, and Gary J. Nutt. Jan 74, 13p
CU-CS-036-74
Grant NSF-GJ-660

Descriptors: *Multiprocessing, *Time sharing, Security, Protection, Logic design, Boolean algebra.
Identifiers: *Data processing security, *Computer information security.

The existence of simultaneously running processes in a multiprocessor system causes certain issues in operating systems design to be critical; deadlock becomes more likely as the number of processes grows; the scheduling of processes to processors becomes less intuitive; and sharing of resources under system authorization becomes more difficult to 'guarantee'. In this paper the authors are interested in quantifying the amount of authorized and unauthorized resource sharing in a class of multiple process, multiple resource systems which employ a particular protection mechansim.

PB-235 294/6GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
BRNANL, A FORTRAN PROGRAM TO IDENTIFY BASIC BLOCKS IN FORTRAN PROGRAMS.
Final rept.,
Lloyd D. Fosdick. Mar 74, 33p* CU-CS-040-74
Grants NSF-GJ-660, NSF-GJ-36461

Descriptors: *Computer programs, *Control sequences, FORTRAN, Subroutines, Compilers.
Identifiers: BRNANL computer program.

A basic block is a sequence of consecutive FORTRAN statements which must be executed consecutively; that is, if one statement in the block is executed, all are executed. Except for special cases noted in the text, a FORTRAN program is a catenation of basic blocks. BRNANL is a FORTRAN program designed to recognize basic blocks in a FORTRAN program. Given a FORTRAN program (FP) BRNANL will generate a modified FORTRAN program (MFP) in which a subroutine call is located at the head of every basic block. Execution of the MFP produces the same results as execution of the FP but the inserted subroutine calls permit monitoring of the execution sequences. User information for running BRNANL is presented.

PB-235 295/3GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
PROBABILISTIC MODELS OF COMPUTER DEADLOCK.
Final rept.,
Clarence A. Ellis. Apr 74, 28p CU-CS-041-74
Grant NSF-GJ-660

Descriptors: *Multiprocessing, *Scheduling, Automata theory, Allocations, Probability theory.
Identifiers: Deadlock.

As the number of processes and resources increase within a computer system, does the probability of that system's encountering deadlock increase or decrease. The problem of deadlock in computer systems and a model applicable to the investigation of this problem are presented. The model treats sequences of resource activity as potential members of the set of strings accepted by a probabilistic automaton. This paper, after explaining the model and its application, describes a transformation on the automaton which makes it amenable to calculations of the probability of deadlock. (Modified author abstract)

PB-235 297/9GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
ANALYSIS OF SOME ABSTRACT MEASURES OF PROTECTION IN COMPUTER SYSTEMS.
Final rept.,
Clarence A. Ellis. May 74, 46p* CU-CS-043-74
Grant NSF-GJ-660

Descriptors: *Data processing, Security, Protection, Logic design, Boolean algebra, Hypotheses, Algorithms.
Identifiers: *Data processing security, *Computer information security.

The area of computer systems protection has been acclaimed as a very important one, and there is a vast amount of literature on the subject. However, implementations of protection mechanisms tend to be ad-hoc and there is a lack of quantitative theoretical results upon which one can base decisions and abstract the essence of protection. This paper is the first to present a mathematically rigorous definition (with proofs) of the degree of protection of a system. It is hoped that this type of presentation will alert systems designers and implementors to alternatives to and generalizations of current implementations and to some of the trade-offs involved in these alternatives. Ultimately, it is hoped that this presentation will contribute to a general Theory of Protection.

PB-235 304/3GA PC$3.75/MF$2.25
Stanford Univ., Calif. Stanford Electronics Labs.
ADAPTIVE DESIGN METHODS FOR CHECKING SEQUENCES.
Technical rept. no. 30,
Raymond T. Boute. Jul 72, 38p SU-SEL-72-034
Grant NSF-GJ-27527

Descriptors: *Logic design, Mathematical logic, Graph theory, Theorems.
Identifiers: Sequential machines, Mealy model, Moore model, Fault detection.

The length of checking sequences for sequential machines can be considerably reduced if, instead of preset distinguishing sequences, one uses so-called 'distinguishing sets' of sequences, which serve the same purpose but are generally shorter.

The design of such a set turns out to be equivalent to the design of an adaptive distinguishing experiment,* though a checking sequence, using a distinguishing set, remains essentially preset. This property also explains the title. All machines having preset distinguishing sequences also have distinguishing sets. In case no preset distinguishing sequences exist, most of the earlier methods call for the use of locating sequences, which result in long checking experiments. However, in many of these cases, a distinguishing set can be found, thus resulting in even more savings in length. (Modified author abstract)

PB-235 309/2GA PC$3.25/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
A CHARACTERIZATION THEOREM FOR A SUBCLASS OF ETOL LANGUAGES.
Final rept.,
A. Ehrenfeucht, and G. Rozenberg. Aug 73, 21p
CU-CS-028-73
Grant NSF-GJ-660

Descriptors: *Automata theory, *Languages, Programming languages, Grammars, Theorems.
Identifiers: Cellular automata, ETOL languages, Formal languages, Context free grammars.

This paper deals with a class of developmental languages. The theory of developmental systems and languages originated in the works of Lindenmayer. This theory provided a useful theoretical framework within which the nature of cellular behavior in development can be discussed, computed, and compared. It turned out that developmental systems and languages are interesting and novel objects from the formal language theory point of view. Especially in comparison with Chomsky grammars and languages they provided a lot of insight into the basic problems of formal language theory.

PB-235 339/9GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
THE NUMBER OF OCCURRENCES OF LETTERS VERSUS THEIR DISTRIBUTION IN SOME EOL LANGUAGES.
Final rept.,
A. Ehrenfeucht, and G. Rozenberg. Aug 73, 26p
CU-CS-030-73
Grant NSF-GJ-660
Prepared in cooperation with Utrecht Rijksuniversiteit (Netherlands). Mathematical Inst.

Descriptors: *Automata theory, *Languages, *Logic design, Grammars, Homomorphisms, Theorems, Netherlands.
Identifiers: Formal languages, EOL languages.

A characterization theorem is given for a class of developmental languages. The theorem binds together the number of occurrences of letters in the works of the given language with the distribution of these letters.

PB-235 563/4GA PC$4.25/MF$2.25
Stanford Univ., Calif. Stanford Electronics Labs.
ALGEBRAIC PROPERTIES OF TEST SEQUENCES AND FAULT RELATIONS.
Technical rept.,
Raymond T. Boute. Nov 72, 52p SU-SEL-72-051, TR-37
Grant NSF-GJ-27527

Descriptors: *Logic design, Switching circuits, Mathematical logic, Boolean algebra, Theorems.
Identifiers: Fault detection, Fault isolation, Sequential machines.

Various experiments used in fault detection are discussed from a unifying point of view. Practical considerations show the need for distinguishing between reset testing and diagnosing sequences, where the first input is a reset input, and ideal testing and diagnosing sequences, where this restriction does not apply. It is shown that most sequences that arise in experiments, in proofs of theorems, etc., may be arbitrarily prefixed or suffixed (and usually both) by any other sequence. This feature characterizes them as ideal sequences and provides them with some important properties that are implicitly used in many circumstances, such as theoretical considerations, deriving existence criteria, and algorithms. (Modified author abstract)

PB-235 564/2GA PC$3.75/MF$2.25
Stanford Univ., Calif. Stanford Electronics Labs.
EQUIVALENCE AND DOMINANCE RELATIONS BETWEEN OUTPUT FAULTS IN SEQUENTIAL MACHINES.
Technical rept.,
Raymond T. Boute. Nov 72, 50p SU-SEL-72-052, TR-38
Grant NSF-GJ-27527

Descriptors: *Logic design, Switching circuits, Logic circuits, Automorphisms, Set theory, Theorems.
Identifiers: *Sequential machine, Fault detection.

Output faults are defined as faults that affect only the output function of a sequential machine. For reduced and strongly connected machines, it is shown that equivalence between output faults that are not combinationally equivalent implies the existence of a nontrivial state table automorphism. This property can be generalized to nonreduced machines in many cases. Combinational dominance between output faults implies reset dominance, but not always vice versa. Necessary and sufficient conditions for reset dominance are derived, and an algorithm is presented to check these conditions. This constitutes an efficient procedure to determine reset dominance. (Modified author abstract)

PB-235 760/6GA PC$3.75/MF$2.25
Stanford Univ., Calif. Stanford Electronics Labs.
AN IMPROVED RELIABILITY MODEL FOR NMR.
Technical rept.,
D. P. Siewiorek. Dec 71, 43p SU-SEL-72-004, TR-24
Grant NSF-GJ-27527

Descriptors: *Logic design, *Reliability(Electronics), Logic circuits, Gates(Circuits), Mathematical models.

The classical reliability model for N-modular redundancy (NMR) assumes the network to be failed when a majority of modules which drive the same voter fail. It has long been known that this model is pessimistic since there are instances, termed compensating module failures, where a majority of the modules fail but the network is nonfailed. A different module reliability model based on lead reliability is proposed which has the classical NMR reliability model as a special case. It is shown that the standard procedure for altering the classical model to take compensating module failures into account may predict a network reliability which is too low in some cases and too high in others. It is also demonstrated that the improved model can increase the predicted mission time (the time the system is to operate at or above a given reliability) by 50% over the classical model prediction for a simple network.

PB-235 773/9GA PC$5.75/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
A TEXT EDITOR DESIGN.
Master's thesis,
Joyce Moore Kai. Jul 74, 139p UIUCDCS-R-74-665

Descriptors: *Editing routines, *Logic design, Computer programming, Algorithms, Theses.
Identifiers: *Text editing systems.

A design for a text editor is developed and described so that it may easily be implemented without further development of the design. The editor avoids movement of text in memory by allowing the text to be stored non-contiguously. The editor provides commands to manipulate text and pointers to text, repeat sets of commands, create macros, and control the display of text.

PB-235 775/4GA PC$5.75/MF$2.25
Maryland Univ., College Park, Md. Dept. of Computer Science.
ARCHITECTURAL DESIGN OF A DIRECTLY-EXECUTED APL PROCESSOR.
Technical rept.,
Bernard J. Robinet. Aug 74, 127p TR-320
Grant NSF-GJ-33013

Descriptors: *Programming languages, Syntax, Grammars, Interpreter routines, Logic design.

This paper describes the architectural design of a processor for a subset of APL. This processor has two separate, distinctive parts of scanner and interpreter; the scanner scans each statement from left to right to create symbol table entries for new identifiers; to generate constant vectors, to analyze header of functions and to convert each statement into a code string of pointers; the interpreter scans the former string, recognizes the syntactic elements and executes the statements as they become ready for the execution. The design of the processor is described precisely in its own entirety, using the Architectural Design Language, or ADL. Flowcharts and architectural diagrams are used extensively for presentation.

PB-235 843/0GA PC$3.75/MF$2.25
Minnesota Univ., Minneapolis. Dept. of Electrical Engineering.
MARKOVIAN MODELS FOR PERFORMANCE ANALYSIS OF MULTIPROCESSOR SYSTEMS.
Technical rept.,
K. V. Sastry, and R. Y. Kain. Jan 74, 44p NSF-OCA-GJ32504TR-1
Grant NSF-GJ-32504

Descriptors: *Multiprocessing, *Computer storage devices, Markov processes, Allocations, Mathematical models, Performance evaluation.

Analytic models are developed to evaluate the performance of a multiprocessor computer system. Markov Chain techniques are used to model memory conflicts when the memory is modularized. Instruction Execution Rate (IER) is chosen as the measure of performance. The model development proceeds with a view to reducing the number of states and providing the capability to study large-scale systems. The performance is studied with different storage allocations for instructions and data, and interleaving the instruction space. Expressions and algorithms to compute the transition probabilities are shown for a simple storage allocation. (Modified author abstract)

PB-235 873/7GA PC$7.25/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
PREPAGING AND APPLICATIONS TO STRUCTURED ARRAY PROBLEMS.
Doctoral thesis,
Kishor Shridharbhai Trivedi. Jul 74, 205p*
UIUCDCS-R-74-662 NSF/OCA-GJ328-000002
Grant NSF-GJ-328

Descriptors: *Computer storage devices, *Computer programming, Allocations, Algorithms, Multiprogramming, Computer programs, Theses.
Identifiers: *Computer storage management, Paging, *Prepaging, Virtual memory.

A demanding prepaging algorithm is defined and proved to be an optimal demand prepaging algorithm. A variable-memory prepaging algorithm PWS is also defined and is based on Denning's WS

algorithm. It is shown that PWS incurs zero page faults. Both of these algorithms, however, cannot be used in practice since they require that the reference string be known in advance. Therefore, the author describes several practical prepaging algorithms. Data paging is of primary concern for problems with large data bases and for many types of array problems. In particular, it is shown that prepaging reduces the paging problems of array algorithms operating on large arrays.

PB-235 874/5GA PC$4.25/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
A BASIC LANGUAGE INTERPRETER FOR THE INTEL 8008 MICROPROCESSOR,
Alfred C. Weaver, Michael H. Tindall, and Ronald L. Danielson. Jun 74, 53p* UIUCDCS-R-74-658

Descriptors: *BASIC programming language, *Interpreter routines, Syntax, Semantics, Operating systems(Computers).
Identifiers: Intel 8008 microprocessor, IBM 360/75 computers, Text editing systems.

A BASIC language interpreter has been designed for use in a microprocessor environment. This report discusses the development of an elaborate text editor and a table-driven interpreter. The entire system, including text editor, interpreter, user text buffer, and full floating point arithmetic routines fits in 16K 8-bit words.

PB-235 875/2GA PC$3.75/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
ON-LINE CHARACTER RECOGNITION,
Alfred C. Weaver. Aug 74, 36p* UIUCDCS-R-74-660

Descriptors: *Character recognition, *Handwriting, Character recognition devices, Computer programs.
Identifiers: On line systems, Feature extraction, Alphanumeric symbols.

This report discusses the current state-of-the-art in computer recognition of handwritten characters. Several current schemes are examined and criticized. A new recognition method is developed using voltage gradient tablet for input and clever software for essential feature extraction. A simulation program is included as an appendix.

PB-235 885/1GA PC$3.75/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
DESIGN IMPROVEMENTS IN THE COLFTAR COOLED CRYSTAL LIGHT-VALUE.
Technical rept.,
Stanley John Kopec, Jr. Jul 74, 46p UIUCDCS-R-74-669

Descriptors: *Data processing equipment, *Electrooptics, Crystals, Coherent radiation, Lasers, Television systems, Light modulation, Design.
Identifiers: *Optical data processing, Pockels cells, COLFTAR(Cooled On-Line Fourier Transform and Reconstruction) systems.

This report describes four improvements to the electronics of the COLFTAR (Cooled On-Line Fourier Transform and Reconstruction) System. These improvements are: the addition of more reliable crystal-temperature sensors, a new higher capacity write gun, synchronization of the entire system, and the addition of dynamic focusing to the write gun circuitry. These changes improve the reliability of the system and provide for improved resolution and contrast.

PB-235 895/0GA PC$6.25/MF$2.25
Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Computer Science.
AUTOMATED EXPLORATION OF THE DESIGN SPACE FOR REGISTER TRANSFER (RT) SYSTEMS.
Final rept.,
Mario R. Barbacci. Nov 73, 170p* NSF/OCA-GJ32758X-RT173
Grant NSF-GJ-32758X

Descriptors: *Computer aided design, *Computer graphics, *Logic design, Computer programming, Parallel processors, Graph theory, Programming languages, Computation.

Early computer aided design (CAD) systems have proved the feasibility and the advantages of the CAD Approach for designing digital systems. They were limited, however, by practical considerations regarding the size of the systems that could be dealt with, the type of analysis that could be performed, the synthesis algorithms etc. These limitations existed mainly because of the low level (gates) of components used as building blocks in the designs being constructed. A feature lacking in existing CAD systems is the exploitation of alternative design implementations derived from an initial behavioral specification. The approach in this thesis is to start with a representation of the desired system in terms of behavioral specifications at the Register Transfer (RT) level, and produce alternative structural specifications at the RT level, in this case, in terms of modular components, the Register Transfer Modules (RTM) set (DEC PDP-16). (Modified author abstract)

PB-235 896/8GA PC$8.75/MF$2.25
Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Computer Science.
A UNIFYING NOTATION AND ANALYSIS OF MODULAR REGISTER TRANSFER (RT) CONTROL.
Final rept,
Wing-Hing Huen. Dec 73, 295p NSF/OCA-GJ32758X-RT273
Grant NSF-GJ-32758X

Descriptors: *Logic design, *Control sequences, Computer programming, Network flows, Graph theory, Scheduling, Boolean algebra, Computer storage devices.
Identifiers: Deadlock, Petri nets.

Several register transfer (RT) module systems have been designed to provide the user with a set of design primitives (control modules and data modules) at a level higher than simple logic gates. This thesis evaluates a number of existing representations for the control of modular, register transfer systems, unifies them by one notation and develops decision procedures, based on this notation, for the detection of deadlocks and checking for safeness of RT control networks. The decision procedures can be applied to all systems expressible by the notation which subsumes the Petri Net and the GMC. (Modified author abstract)

PB-235 935/4GA PC$3.75/MF$2.25
Woods Hole Oceanographic Institution, Mass.
AN INTEGER PROCEDURE FOR THE DISCRETE FAST FOURIER TRANSFORM.
Technical rept.,
Kenneth E. Prada. May 74, 32p WHOI-Ref-74-32
NSF/IDOE-74-31
Grant NSF-GX-28193

Descriptors: *Data processing, *Signal processing, *Fourier transformation, Subroutines.
Identifiers: Discrete fourier transform, Fast fourier transform, Floating point operation.

An integer procedure for the discrete Fast Fourier Transform results in 160 fold increase in speed and 4 fold decrease in memory requirements over floating-point methods. The procedure is implemented as a machine language subroutine for the Hewlett-Packard computer series.

RISO-M-1720 PC$4.00/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
SCALING AND TESTING OF ANALOG COMPUTERS WITH THE HELP OF DIGITAL COMPUTERS.
K. S. Hoejberg. 6 May 74, 14p
In Danish. U.S. Sales Only.

Descriptors: (*Analog computers, *Performance testing), Digital computers, Electronic equipment.

For abstract, see NSA 30 08, number 23321.

RL-74-059 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
MNLISTPR: A LIST PROCESSING PACKAGE FOR FLEXIBLE STORAGE OF DATA.
M. J. Newman. Apr 74, 10p
U.S. Sales Only.

Descriptors: (*Computer codes, *M codes), Data processing, Efficiency, Fortran, Information retrieval.

For abstract, see NSA 30 08, number 23322.

RT/EL-(74)1 PC$5.50/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
ADVANCED MEMORY.
A. Serra. Jan 74, 47p
In Italian. U.S. Sales Only.

Descriptors: Computers, Design, Memory devices.

For abstract, see NSA 30 08, number 23323.

SAND-74-8201 PC$4.50/MF$2.25
Sandia Labs., Livermore, Calif.
PILOT MANUAL FOR SALOGS LOGIC SIMULATION PROGRAM.
M. A. Soderstrand. Aug 74, 26p
Contract AT(29-1)-789

Descriptors: (*Digital circuits, *Simulation), Computer graphics, Cost, Design, Diagrams, Fortran, Integrated circuits, Interactive display devices, Interfaces, Manuals, Plotters, Reliability.

For abstract, see NSA 30 08, number 23325.

SLA-74-0195 PC$8.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
MINICOMPUTER SAFETY CONTROL AND DATA SYSTEM FOR AN EXPLOSIVE FACILITY.
M. H. Woodward. Jun 74, 108p
Contract AT(29-1)-789

Descriptors: Automation, Chemical explosives, Computers, Control, Control systems, Data acquisition, Data processing, Operation, Programming, Safety, Safety engineering.

For abstract, see NSA 30 08, number 23329.

TUBIK-28 PC$6.00/MF$2.25
Technische Univ. Berlin (F.R. Germany). Inst. fuer Kerntechnik.
CALCULATION OF RELIABILITY DATA FOR COMPLEX SYSTEMS USING THE SUCCESS PATHS METHOD.
G. Richter, and G. Memmert. Oct 73, 58p
In German. U.S. Sales Only.

Descriptors: Availability, Computer codes, Computers, Failures, Inspection, Maintenance, Numerical solution, Programming, Reliability.

For abstract, see NSA 30 08, number 23332.

UCID-16462(Rev.1) PC$12.50/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
LECTURE NOTES FOR A COURSE IN THE FUNDAMENTALS OF DIGITAL SYSTEMS.
D. K. Fisher. May 74, 190p
Contract W-7405-eng-48

Descriptors: Design, Digital computers, Digital systems, Education, Operation, Programming.

For abstract, see NSA 30 08, number 23333.

UCID-16507 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
OCTAL DEBUGGING PROGRAM (ODT) FOR MCS-8 COMPUTER.
E. Fisher, and J. English. 13 Nov 72, 16p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *Corrections), Computers, Errors, Programming languages.

For abstract, see NSA 30 08, number 23334.

UCID-16532 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
1- AND 2-D COMPUTER ANALYSIS OF AN HDL STRESS WAVE SWITCH.
J. Mahler. 25 Jun 74, 12p
Contract W-7405-eng-48

Descriptors: (*Switches, *Mathematical models), Closures, Computer calculations, Computer codes, H codes, K codes, One-dimensional calculations, Projectiles, Stresses, Two-dimensional calculations, Velocity.

For abstract, see NSA 30 08, number 23335.

UCID-30085 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
IMPLEMENTING STANDARD TAPE BCD I/O ON THE MODCOMP COMPUTER.
C. M. Geertgens, and E. D. Luebke. 21 May 74, 16p
Contract W-7405-eng-48

Descriptors: Computer codes, Computers, Fortran, M codes, Magnetic tapes.

For abstract, see NSA 30 08, number 23337.

UCLA-10-P-14-129 PC$4.75/MF$2.25
California Univ., Los Angeles.
FORMAL REQUIREMENTS FOR VIRTUALIZABLE THIRD GENERATION ARCHITECTURES.
G. J. Popek, and R. P. Goldberg. 1974, 14p CONF-731076-1
Contract AT(04-3)-34

Descriptors: Computers, Design, Ibm computers, Pdp computers, Programming languages, Simulation.

For abstract, see NSA 30 08, number 23338.

9C. Electrical and Electronic Engineering

AD-785 858/2GA PC$7.50/MF$2.25
Georgia Inst of Tech Atlanta Engineering Experiment Station
FAA/GEORGIA TECH. WORKSHOP ON THE GROUNDING OF ELECTRONIC SYSTEMS.
Mar 74, 245p FAA-RD-74-147
Contract DOT-FA72WA-2850

Descriptors: *Electrical grounding, *Meetings, Signals, Coding, Electromagnetic shielding, Standards, Electronic equipment.

A state-of-the-art review and background research reveals a significant divergence of opinion as to the prefered techniques of grounding of electronic equipments and systems. There exists an absence of agreement on a unified approach to grounding which is applicable to all frequency ranges and signal types. The System Research and Development Service of the Federal Aviation Administration in conjunction with the Engineering Experiment Station of the Georgia Institute of Technology conducted a workshop which brought together distinguished experts in the field of grounding as related to EMI/EMC lightning and the National Electrical Code. This report contains the papers presented at the workshop. (Author)

AD-786 005/9GA PC$7.25/MF$2.25
Colorado Univ Boulder Dept of Electrical Engineering
VARIABLE SPEED COMMUTATORLESS ENERGY CONVERTERS.
Final rept. Sep 71-Dec 73 on Phase A,
Edward A. Erdelyi, and David A. Remington. Dec 73, 206p
Contract DAAK02-70-C-0244
Report on Investigation of Three-Phase Induction Motors Supplied by Square and Staircase Wave Voltages.

Descriptors: *Induction motors, *Variable speed drives, Drives, Electrical equipment, Numerical analysis, Computer programs, Runge Kutta method.

The theory of three phase squirrel cage induction motors supplied by chopped d.c. supplies is developed. The differential equations are solved by a fourth order Runge-Kutta method explained in the appendix. The waveform of the applied voltage is either square of staircase in shape. The numerical method, specially modified for the application, yields the following results: (a) Current waveshapes in the stator when square wave voltages of 20 Hz to 120 Hz, and stepped wave voltages of 30 to 100 Hz, are applied to the stator terminals. (b) The torque variations at different loads and frequencies. (c) The slip variations at different loads and frequencies. (Modified author abatract)

AD-786 156/0GA PC$4.75/MF$2.25
General Electric Corporate Research and Development Schenectady N Y
CRYOGENIC SYSTEMS AND SUPERCONDUCTIVE POWER.
Final technical rept. 1 Oct 73-16 Jul 74 on Phase 3,
B. D. Hatch, J. D. Hurley, D. W. Jones, and E. T. Laskaris. 16 Jul 74, 90p Rept no. GE-SRD-74-080
Contract DAHC15-72-C-0235, ARPA Order-2200
See also Semiannual technical rept. no. 1, AD-758 431.

Descriptors: *Propulsion systems, *Electric generators, *Electric motors, Superconductors, Machines, Coils, Cryogenics, Liquid metals, Gallium, Marine propulsion.

Extreme environments are a common requirement of military applications of propulsion machinery. It is essential that superconductive propulsion systems for ships and military vehicles be of rugged and highly reliable construction. For this reason, dominant emphasis has been given during Phase III to shock and vibration testing of representative superconductive coils while operating in a superconducting mode near the upper current density limit. Supplementary tests have also been made to determine structural and mechanical properties of materials applicable to the composite material of the superconductive coil while at liquid helium temperatures. The second area of experimental evaluation conducted during Phase III involved liquid metal collectors for acyclic superconductive machines in which gallium is used as the liquid metal. These tests have been conducted to identify potential materials and process problem areas and to demonstrate the potential resolution of such problems. (Author)

AD-786 240/2GA PC$3.25/MF$2.25
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
THEORY AND DESIGN OF ELECTRICAL ROTATING MACHINERY.
Annual technical rept. no. 2, 1 May 73-30 Apr 74,
W. J. Carr, Jr. Sep 74, 16p
Contract N00014-72-C-0432
See also Annual technical rept. no. 1, AD-762 766.

Descriptors: *Electric motors, *Superconductors, Machines, Electrical equipment, Hysteresis, Alternating current, Losses, Eddy currents, Rotation, Naval equipment, Generators, Filaments.

The objective of the program is to contribute toward new and improved rotating machines for Naval applications, with emphasis on superconducting machinery. An important factor in the design of superconducting machinery is the A.C. hysteresis and eddy current loss which occurs in the multifilament conductors generally used for A.C. operation. Reduction of this loss, to reduce the required refrigeration capacity, is necessary for wide-range use of superconducting machines. Theory has been developed and substantial progress has been made toward understanding the A.C. loss in multifilament conductors. The theory may be used for the design of optimum conductors. In the area of actual machine research, a low speed, high torque heteropolar D.C. superconducting motor has been studied with encouraging results. In addition the maximum power rating of various types of D.C. machines has been estimated. (Author)

N74-29561/9GA PC$10.00/MF$2.25
Technische Universitaet, Brunswick (West Germany).
OPERATIONAL BEHAVIOR OF ASYNCHRONOUS MACHINES DURING CONSTANT VOLTAGE, ALTERNATING CURRENT FEED CONSIDERING SATURATION BETRIEBSVERHALTEN VON KURZSCHLUSSLAEUFERMASCHINEN BEI WECHSELRICHTERSPEISUNG MIT KONSTANTER SPANNUNG UNTER BERUECKSICHTIGUNG DER SAETTIGUNG.
Ph.D. Thesis.
E. Heers. 1973, 139p
Language in German.

Descriptors: *Alternating current, *Rotating electrical machines, *Volt-ampere characteristics, Circuit protection, Numerical analysis, Rotor speed, Surges, Thyristors, Voltage regulators.

For abstract, see STAR 1219

N74-29567/6GA PC$5.75/MF$2.25
Technische Hochschule, Hanover (West Germany).
INTERRUPTION OF SMOOTH RUNNING ALTERNATING CURRENT ASYNCHRONOUS MACHINES CAUSED BY ELECTROMAGNETIC INDUCTION UEBER DIE STOERUNG DER LAUFRUHE VON DREHSTROMASYNCHRONMASCHINEN INFOLGE ELEKTROMAGNETISCHER ANFACHUNGEN.
Ph.D. Thesis.
H. Haase. 1973, 55p
Language in German.

Descriptors: *Alternating current, *Electromagnetic interference, *Rotating electrical machines, Induction motors, Magnetic induction, Rotating shafts, Self induced vibration.

For abstract, see STAR 1219

N74-29568/4GA PC$17.00/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
A CONTRIBUTION TO THE DEVELOPMENT OF STEPPING MOTORS.
Ph.D. Thesis.
A. J. C. Bakhuizen. 5 Oct 73, 279p

Descriptors: *Servomotors, *Step functions, *Synthesis, Dynamic characteristics, Rotating electrical machines, Torque motors.

For abstract, see STAR 1219

N74-29571/8GA PC$4.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
THE APPLICATION OF THE ANALOG SIGNAL TO DISCRETE TIME INTERVAL CONVERTER TO THE SIGNAL CONDITIONER POWER SUPPLIES.
A. D. Schoenfeld, and Y. Yu. Aug 73, 34p NASA-CR-120906
Contract NAS3-16797

Descriptors: *Analog circuits, *Direct power generators, *Power conditioning, Breadboard models, Direct current, Feedback control, Microminiaturized electronic devices, Power supplies.

For abstract, see STAR 1219

9D. Information Theory

AD-785 850/9GA PC$4.25/MF$2.25
Naval Underwater Systems Center New London Conn New London Lab
AN APPROXIMATE FAST FOURIER TRANSFORM TECHNIQUE FOR VERNIER SPECTRAL ANALYSIS.
Technical rept.,
Albert H. Nuttall. 16 Aug 74, 52p Rept no. NUSC-TR-4767

Descriptors: *Signal processing, *Fourier transformation, Spectrum analysis, Sampling, Computations, Frequency analyzers.
Identifiers: *Fast Fourier transform, Signal detection, Vernier spectral analysis.

An approximate and quick fast Fourier transform technique for vernier spectral analysis is derived and tested for several candidate time-and delay-weightings, and for overlaps of the time weightings. For 50 percent overlap, the use of a simple cosine lobe for the time weighting yields spurious spectral sidelobes at least 23 dB below the main peak, whereas Dolph-Chebyshev time weighting achieves -33 dB sidelobes. For 75 percent overlap, use of a (cosine)(sup 5) lobe for the time weighting yields sibelobes at least 54 dB down, whereas Dolph-Chebyshev time weighting achieves -86 dB sidelobes. In both cases of overlap, use of delay weighting is also required and is taken as a Hanning weighting. Extensions to other overlaps and weightings are possible from the fundamental relations presented and from the sample program furnished. (Author)

AD-786 066/1GA PC$5.25/MF$2.25
University of Southern California Los Angeles Electronic Sciences Lab
MULTI-VALUED CROSS-CORRELATION FUNCTIONS BETWEEN TWO MAXIMAL LINEAR RECURSIVE SEQUENCES.
Doctoral thesis,
Yoji Niho. Jan 72, 115p Rept no. USCEE-409
AROD-7193.3-RT
Grants DA-ARO-D-31-124-70-G104, DA-ARO-D-31-124-70-G930

Descriptors: *Coding, *Recursive functions, Sequences(Mathematics), Number theory, Polynomials, Theorems, Theses.
Identifiers: Cyclic codes, Hamming codes, Spread spectrum techniques, *Cross correlation.

AD-786 119/8GA PC$10.50/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
MODELS OF THE SOURCE OF ERRORS IN TRANSMISSION CHANNELS OF DIGITAL INFORMATION,
E. L. Blokh, and O. V. Popov. 31 Jul 74, 418p Rept no. FTD-MT-24-516-74

Edited machine trans. of mono. Modeli Istochnika Oshibok v Kanalakh Peredachi Tsifrovoi Informatsii, Moscow, 1971 p1-312, by Charles T. Ostertag, Jr.

Descriptors: *Information theory, *Data transmission systems, Stochastic processes, Entropy, Signal processing, Markov processes, Translations, USSR.
Identifiers: *Data transmission.

The book deals with the investigation of questions of the mathematical description of the laws governing the emergence of errors in the real transmission channels of digital information. General models are given which reflect these laws, and their most important special cases. The methodology is stated for the construction of such models on the basis of experimental data relating to some telephone channels.

N74-29496/8GA PC$9.50/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
CHANNEL CODING AND DATA COMPRESSION SYSTEM CONSIDERATIONS FOR EFFICIENT COMMUNICATION OF PLANETARY IMAGING DATA.
R. F. Rice. 15 Jun 74, 128p NASA-CR-139362, JPL-TM-33-695
Contract NAS7-100

Descriptors: *Channels (Data transmission), *Data transmission, *Imaging techniques, *Signal encoding, Information theory, Telemetry, Transmission efficiency.

For abstract, see STAR 1219

9E. Subsystems

AD-785 604/0GA PC$3.25/MF$2.25
Army Electronics Technology and Devices Lab Fort Monmouth N J
A NEW MONOLITHIC CRYSTAL FILTER USING PIEZO-ELECTRIC COUPLING BETWEEN ANISOTROPIC LAMINAE,
Arthur Ballato, and Theodore Lukaszek. 1970, 16p

Descriptors: *Crystal filters, Piezoelectric crystals, Stacking, Band pass filters, Monolithic structures(Electronics).

The paper presents a systematic and comprehensive analytical treatment of thickness-mode plate vibrations in stacked piezoelectric crystals that is at once rigorous and practical. The results are cast in terms of distributed electrical networks that reduce arduous mathematical procedures to standard circuit theory ant network manipulations. These are then applied to analyze a novel type of frequency-sensitive device - - the stacked-crystal filter. Experimental realizations of this device prove what is predicted on the basis of computer simulations applied to the networks: that this family of devices, and, by extension, other classes of devices based upon the stacking principle applied to piezoelectric crystal laminae, possess a striking potential for satisfying current and future frequency- and time-control requirements of Army secure communications. In particular, highly temperature-stable stacked-crystal bandpass filters are inherently capable of wideband operation with low insertion loss and extraordinary mode special purity.

AD-785 636/2GA PC$3.25/MF$2.25
Army Electronics Technology and Devices Lab Fort Monmouth N J
DIELECTRIC WAVEGUIDES FOR MILLIMETER-WAVE INTEGRATED CIRCUITS,
Harold Jacobs, and Metro M. Chrepta. 1971, 14p

Descriptors: *Dielectric waveguides, *Integrated circuits, Microwave equipment, Millimeter waves, Silicon.

An approach to millimeter-wave integrated circuits was studied in which silicon dielectric waveguides are used as transmission lines. Compatible devices and components can be built into the line or attached to the line in such a manner that generation, control, and processing of the signal can be carried out by conductivity modulation techniques. Experiments were carried out demonstrating that mechanical phase shifters and tuning elements, based on this principle, can provide as much as 250 degrees/cm phase shift. Electronic phase shifters were demonstrated with 90 degrees/cm and little or no change in attenuation. Oscillators were constructed in semiconductor dielectric cavities for the first time with unloaded and loaded quality factors competitive with metal waveguides.

AD-785 637/0GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
RADIAL BEAM MICROWAVE AMPLIFIER,
Louis J. Jasper, Jr. 1973, 15p

Descriptors: *Microwave amplifiers, *Traveling wave tubes, Printed circuits, Microwave equipment, Phased arrays, Radar, Jamming.

The Radial Beam Microwave Amplifier (RBMA) is a new class of printed circuit TWT's that can operate with voltages less than 300 colts. The important features of this amplifier such as multi-octave bandwidth, low voltage operation, low cost, and compact size were shown. The prime military applications for this device and possible civilian applications were pointed out.

AD-785 689/1GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
AN INTEGRATED APPROACH TO COMPUTER AIDED DESIGN AND FABRICATION OF DISTRIBUTED PARAMETER MICROWAVE DEVICES,
George E. Sumrall, and David K. Ruppe. 1969, 16p

Descriptors: *Microwave equipment, Microwave filters, Strip transmission lines, Computer applications, Fabrication, Passive systems.
Identifiers: Computer aided design.

A method was developed to apply Computer Aided Design (CAD) methods to the design of distributed parameter microwave devices and to produce the design results in a form and format which is directly usable by Numerical Control (NC) fabrication equipment. By taking an integrated approach, the improved design accuracy (better than plus or minus .001 in.) can be carried directly into the fabrication process, which is also capable of accuracies of plus or minus .001 in. Thus it is possible to quickly design and fabricate devices which need a minimum of adjustment.

AD-785 705/5GA PC$5.75/MF$2.25
Fairchild Camera and Instrument Corp Mountain View Calif Fairchild Semiconductor Div
STUDIES OF THE NUCLEAR RADIATION PERFORMANCE OF ISOPLANAR INTEGRATED CIRCUITS AND CIRCUIT COMPONENTS.
Final rept. 12 Jul 72-21 Jan 74,
R. W. Marshall, and D. K. Myers. Jan 74, 139p
HDL-TR-002-1
Contract DAAG39-73-C-0002

Descriptors: *Integrated circuits, Radiation effects, Transistors, Semiconductor diodes.

The report describes the work accomplished in a program to measure and analyze the nuclear radiation performance of transistors, diodes, and integrated circuits fabricated with the standard Fairchild Isoplanar processes, the Fairchild dielectrically isolated Isoplanar process, and the Fairchild Isopoly or V-groove dielectric isolation process. These devices were characterized electrically and then exposed to ionizing dose, transient gamma, and fast neutron radiation environments to determine the effects of these environments on

device performance. The possibility of new and/or different failure modes that could limit the use of these devices in the various radiation environments was investigated. (Modified author abstract)

AD-785 711/3GA PC$6.25/MF$2.25
Philco-Ford Corp Palo Alto Calif Western Development Labs Div
INTERMODULATION STUDY. (INTERMODULATION PRODUCTS - SATELLITE GROUND ANTENNAS).
Final test rept. 1 Apr 72-1 Apr 73,
J. V. Rootsey, A. A. Gradisar, and J. R. P. Bordenave. 24 Aug 73, 166p Rept no. WDL-TR-5243
Contract DAAB07-72-C-0207
Report on HT-MT Terminals Program.

Descriptors: *Antenna feeds, Intermodulation, Parabolic antennas, Horn antennas, X band, Satellite communications, Waveguides.

A description of tests, observations, problems and results of work performed to reduce the intermodulation products generated in the 5-horn feed of a 60-foot diameter parabolic antenna. The goal was to produce feed components that generated intermodulation products at levels below -140 dBm while subjected to 10 kW CW of total power in any combination of carriers. The receive band was 7.25 to 7.75 GHz; the transmit band was 7.9 to 8.4 GHZ. The study was conducted in three phases: The determination of intermodulation levels as a function of total power, proportional power between carrier, waveguide current densities, vacuum, and test configuration; Specific problems encountered in fabricating waveguide devices, specifically flanges, seams, materials, tuning methods, and the degeneration of these factors with time; An effort to obtain specific intermodulation-free components, particularly stable filters and flanges. (Author)

AD-785 714/7GA PC$3.75/MF$2.25
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
ELECTROLUMINESCENT FILM DISPLAY DEVICE.
Quarterly rept. no. 4, 22 Nov 72-22 Feb 73,
Thomas P. Brody, William S. Escott, Willie Lehmann, and David H. Davies. Aug 74, 34p Rept no. 74-9F2-DSPLA-R1 ECOM-72-0061-4
Contract DAAB07-72-C-0061
See also AD-768 207.

Descriptors: *Display systems, Electroluminescence, Panels, Thin films, Transistors, Phosphorescent materials.
Identifiers: Electroluminescent panels, Flat panel displays.

During the reporting period, progress in fabricating 6 in. x 6 in. thin film transistor (TFT) display circuits was slowed due to equipment failure. These problems were largely overcome. A technique was devised, and demonstrated, for making good edge connections to the array using evaporated metal fingers. Considerable efforts was devoted to constructing an alternative vacuum deposition system, with alignment jigs, etc., in order to increase the rate of circuit panel fabrication. Initial design and fabrication of a display exerciser was begun. A 5 x 7 matrix format for alphanumeric read-out was chosen, the exerciser will refresh the display on a row by row basis every 1.2 mS. Further studies on uniformity and stability continued with encouraging results. (Author)

AD-785 715/4GA PC$3.75/MF$2.25
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
THIN FILM TRANSISTOR-ADDRESSED DISPLAY DEVICE.
Quarterly rept. no. 5, 22 Feb 73-22 May 73,
Thomas P. Brody, Willie Lehmann, Zoltan P. Szepesi, G. F. Saletta, and David H. Davies. Aug 74, 44p Rept no. 74-9F2-DSPLA-R2 ECOM-72-0061-5
Contract DAAB07-72-C-0061
See also AD-785 714.

Descriptors: *Display systems, Electroluminescence, Panels, Thin films, Transistors, Phosphorescent materials.
Identifiers: Electroluminescent panels, Flat panel displays.

Design of the final thin film version (signal and power transistor) of the flat panel display control circuit was completed and further progress in fabrication made. Device uniformity tests on the 6 in. x 6 in. panel were conducted and the results exceeded expectations. Considerable progress was made in understanding the principles of the 'hypermaintenance' electroluminescent (EL) phosphor and how the phosphor fabrication process influences life. Excellent maintenance of EL phosphor brightness was achieved with 1,000 - 10,000 hours of 5000 c.p.s. operation, at 150 V, already demonstrated on material of 50 fL initial brightness. The display exerciser construction was completed, it was tested and performed to specifications. (Author)

AD-785 862/4GA PC$6.25/MF$2.25
TRW Systems Group Redondo Beach Calif
MODELLING, CHARACTERIZATION AND MEASUREMENT OF OSCILLATOR FREQUENCY INSTABILITY.
Final rept.,
William C. Lindsey, and James L. Lewis. 14 Jun 74, 159p
Contract N00014-72-C-0107
Prepared in cooperation with LinCom Corp., Pasadena, Calif.

Descriptors: *Oscillators, Frequency, Stability, Instability, Phase studies, Mathematical models.
Identifiers: Frequency stability.

A mathematical characterization of oscillator amplitude, frequency and phase instability is given here in terms of the respective structure functions of amplitude, frequency and phase. Two classes of oscillator frequency processes are exploited, viz., those which are stationary and those possessing stationary increments. Numerous examples are given which can be used to characterize and model oscillator frequency spectra, hence frequency instability, observed in quartz crystal oscillators, injection-locked Gunn oscillators, rubidium and cesium frequency standards, multiplier chains and mixers used in the implementation of coherent communication receivers and transponders. Their affects on the phase error of a phase-locked loop are explored.

AD-785 888/9GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
PROBLEMS IN SYNTHESIZING AMPLITUDE RADIATION PATTERNS,
Yu. I. Choni. 9 Apr 74, 12p Rept no. FSTC-HT-23-1719-73
Trans. of Aviatsionnyi Institut, Kazan. Trudy (USSR) n104 p3-10 1970.

Descriptors: *Antenna radiation patterns, Approximation, Hilbert space, Amplitude, Translations, USSR.

The problem of the optimal root-mean-square approximation to a desired amplitude radiation pattern, free of any constraints on the nature of antenna excitation, is examined.

AD-785 903/6GA PC$5.25/MF$2.25
Stanford Univ Calif Stanford Electronics Labs
ISINC - AN MOS SIMULATOR FOR INTEGRATED NONLINEAR CIRCUITS WITH MODULAR BUILT-IN MODEL.
Technical rept.,
T. K. Young, and R. W. Dutton. Jul 74, 119p Rept nos. SU-SEL-74-038, TR-5010-1
Contract N00014-67-A-0112-0044

Descriptors: *Integrated circuits, *Simulators, Metal oxide semiconductors, Transistors, Models, Computer applications, Response, Transients.
Identifiers: Computer aided design.

The paper describes MSINC, an MOS Simulator for Integrated Nonlinear Circuits. MSINC simulates the nonlinear dc and transient responses of MOS transistor circuits. The modular feature facilitates the alteration and replacement of semiconductor device models. Models other than MOS transistors can be implemented within the constraints of four external and two internal nodes. Only two subroutines need to be changed for model implementation - one for inputting the model specifications and the other for constructing the equivalent circuit for the device model. The structure of MSINC, the equation set-up procedure and the second-order MOS transistor model implemented in MSINC are described. (Author)

AD-785 920/0GA PC$50.00/MF$50.00
IIT Research Inst Chicago Ill Reliability Analysis Center
MICROCIRCUIT DEVICE ENVIRONMENTAL DATA.
Apr 74, 369p* Rept no. RAC-MDED-0474
Contract F30602-73-C-0065
See also report dated Apr 73, AD-761 951.

Descriptors: *Microcircuits, *Integrated circuits, Reliability(Electronics), Environmental tests, Hybrid circuits.

The tabulation contains environmental test results which are organized and presented by device manufacturer and part numbers. It provides, for each entry, a description of the device function, technology, package type, screen level and manufacturing date (date code), in addition to the applied environmental conditions. Percent defective statistics and failure modes/mechanisms are reported. The compendium is updated in its entirety and reissued annually. (Author)

AD-785 939/0GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
NONLINEAR PROPERTIES OF THE INPUT CIRCUIT OF A TRANSISTOR WITH AUTOMATIC BIAS,
V. I. Samoilenko, and G. A. Bogdanova. 2 Apr 74, 11p Rept no. FSTC-HT-23-1776-73
Trans. of Aviatsionnyi Institut, Moscow. Trudy (USSR) n215 p150-160 1970.

Descriptors: *Circuits, Transistors, Input, Translations, USSR.

A technical insight into the complexities of input circuits in transistors with automatic bias. The authors, by using graphs and tables, take the reader logically through the text and give clear explanations of each step.

AD-785 940/8GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
THE PHYSICAL OPTICS OF FOCUSED SCATTERERS USING SOURCE MULTIPOLE EXPANSIONS.
Scientific rept.,
Willard V. T. Rusch. 25 Jul 73, 8p AFOSR-TR-74-1401
Contract F44620-71-C-0067
Revision of report dated 1 Mar 73.
Availability: Pub. in IEEE Transactions on Antennas and Propagation, vAP-22 n2 p236-241 Mar 74.

Descriptors: *Parabolic antennas, Electromagnetic fields, Scattering, Computations, Reflectors, Antennas.

A multipole-expansion technique is developed which permits the two-dimensional scattering integral for reflector antennas to be replaced by a finite sum of simple algebraic terms. The series, which accurately represents the radiated field over the main antenna beam and first few sidelobes, converges rapidly because the source dimensions are small. It is demonstrated that the reciprocity theorem is satisfied by the boresight physical-optics field of a paraboloid illuminated by a generalized linear electric current feed centered at the focus. (Author)

AD-785 959/8GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif Lab Operations
MULTI-BAND REFLECTOR ANTENNA SYSTEMS STUDY.
Final rept.,
Jimmy L. Wong, and Howard E. King. 30 Aug 74, 50p Rept no. TR-0075(5230-40)-2 SAMSO-TR-74-214
Contract F04701-74-C-0075

Descriptors: *Antennas, Reflectors, Antenna feeds, Multiple operation, Ultrahigh frequency, L band, Integrated systems, C band, Microwave antennas, Antenna radiation patterns.

A study was made to investigate the feasibility of utilizing a single reflector aperture radiating at UHF, L-band, and C-band frequencies. Radiation measurements were performed at UHF (335 MHz) and at L-band (1200 to 1600 MHz). The feasibility of an integrated L-band and C-band feed system was established; however, no measurements were made on the C-band characteristics because it was an optional requirement. Two types of L-band feeds were evaluated: a cavity-backed open-sleeve dipole, and a probe-excited coaxial cavity. The measured VSWR and patterns of these feeds are shown. The cavity-backed dipole feed was incorporated into a 6-ft parabolic reflector to determine the reflector antenna performance at L-band with and without the presence of a UHF dipole mounted at the vertex of the reflector. With the UHF dipole mounted at the vertex of the reflector and as a prime-focus feed, the UHF radiating characteristics were measured. Concepts for integrating a C-band system with the L-band feeds are provided. (Author)

AD-785 965/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
DISTRIBUTION OF GLAZE-RIME DEPOSITS IN THE LOWER 300-METER LAYER OF THE ATMOSPHERE,
V. G. Glukhov. 18 Mar 74, 19p Rept no. FSTC-HT-23-1816-73
Unedited trans. of Glavnaya Geofizicheskaya Observatoriya, Leningrad. Trudy (USSR) n246 p63-72 n.d.

Descriptors: *Ice formation, *Transmission lines, Translations, USSR.
Identifiers: *Power lines.

Ice glaze-rime deposits produce very sizeable loads on structures. Intense deposits cause breaks in wire and power transmission lines (PTL) and communication lines (CL), collapsing of supports, demolition of towers, antennas, and so on. Therefore in designing and operating PTL, CL, and various kinds of tall structures, one must know the possible load they must bear of glaze and rime. From observations on Obnisk Tower in the winter of 1963-1964 a detailed study was made of several cases of glaze and rime formation in the moist near-cloud layer, fog, and in radiation cooling. The aim of this study is to generalize from observational data made of glaze in the 300 m layer, taken at the Obnisk Tower in 1962-1967.

AD-785 984/6GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
ANALYSIS OF THE OPERATION OF A BANK WITH STORED ENERGY OF 625 KJ IN A PHYSICAL MODEL,
V. V. Konotop, V. S. Gladkov, and Yu. S. Nemchenko. 5 May 74, 13p Rept no. FSTC-HT-23-0140-74
Trans. of mono. Magnitnye Lovushki, Kiev, 1965 p147-156.

Descriptors: *Capacitors, Arrays, Connectors, Operation, Translations, USSR.

The article includes an analysis of operation of a 625 KJ low-voltage bank model containing KIMS-1 type low-inductance capacitors in parallel and parallel-series connection. Table 1 gives the data on choice of model scale by voltage according to connecting circuit, and Table 2 gives the values of inductance and capacitance of the bank model. Also included is a discussion of oscillograms of voltage in the parallel circuit and of voltage in the load with cables of equal and various lengths.

AD-785 985/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THERMAL INTERACTION IN INTEGRATED CIRCUITS,
D. I. Zaks, and N. M. Naumov. 9 Apr 74, 18p Rept no. FSTC-HT-23-1664-73
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Radioelektronika (USSR) v14 n11 p1304-1311 1971.

Descriptors: *Integrated circuits, Interactions, Thermal properties, Translations, USSR.

Interactions take place in integrated circuits between the thermal and electrical fields (thermal interaction). This phenomenon, frequently degrading the operation of semiconductor instruments, can be used for creation of low frequency range integrated circuits. Several examples of such circuits and models of them are examined.

AD-786 022/4GA PC$5.25/MF$2.25
Northrop Research and Technology Center Hawthorne Calif
RADIATION HARDENING OF LINEAR MICROCIRCUITS BY TERMINAL PHOTOCOMPENSATION.
Final rept. 15 Apr 72-1 Aug 73,
D. N. Pocock, and M. G. Krebs. Jun 74, 124p AFWL-TR-73-110
Contract F29601-72-C-0084

Descriptors: *Microcircuits, *Radiation hardening, Linear systems, Integrated circuits, Photoelectricity, Electric current, Compensation.
Identifiers: Photocompensation.

The feasibility of using terminal photocompensation to reduce the ionizing-radiation vulnerability of linear microcircuit amplifiers is investigated. An analytical basis for terminal 'photocharge' compensation is presented. Linear terminal models are developed for four types of integrated circuit amplifiers and are used to analyze the qualitative effects of terminal photocompensation. Experimental results show that two of the four microcircuits can be photocompensated with at least an order-of-magnitude reduction in the radiation-induced noise energy for several cases of external circuit configuration and radiation intensity. (Author)

AD-786 024/0GA PC$4.25/MF$2.25
Texas Instruments Inc Dallas Semiconductor Group
REWORK OF LINEAR INTEGRATED CIRCUITS.
Final rept. 31 May 72-18 Feb 74,
James A. Lipman. Jun 74, 72p AFWL-TR-74-53
Contract F29601-72-C-0095

Descriptors: *Integrated circuits, *Radiation hardening, Transistors, Reliability(Electronics), Neutrons, Test methods.

A-C probe techniques for screens and controls were evaluated to ensure radiation hardness of integrated circuits (ICs). A dielectrically isolated, photocurrent compensated linear IC was the test vehicle. A special metal pattern was used to isolate and provide probe pad leads for each active device on the IC. Air Force Weapons Laboratory personnel then probed the devices to determine the parameters that might indicate neutron hardness assurance. After the probing, the metal pattern was removed from a number of the devices which were then processed normally with NiCr, metal, and quartz overcoat. Possible damage to the silicon transistors caused by the special or the normal processes was evaluated by photographing a number of the bars and some slices from the devices. A unique procedure was used to label the separate bars so that their physical location on the slice could be determined after dicing. (Author)

AD-786 045/5GA PC$4.25/MF$2.25
Owens-Illinois Inc Toledo Ohio
RUGGEDIZED PLASMA PANEL.
Final rept. Jun 73-Mar 74,
L. J. Roth, and R. A. Moser. Aug 74, 55p RADC-TR-74-202
Contract F30602-73-C-0315

Descriptors: *Display systems, Plasmas(Physics), Panels, Matrices(Circuits), Gas discharges.
Identifiers: *Flat panel displays, *Plasma display panels.

The report is part of an overall effort to develop a reliable, fully qualified, flat panel, gas discharge display console to survive and operate in a hostile environment such as encountered in field or airborne command and control systems. The specific objective of this portion of the overall effort is to redesign the panel driving electronic system of the Owens-Illinois, Incorporated commercial DIGIVUE model 512-60 Display/Memory Unit. This report contains the engineering grade documentation and analysis accomplishing this task. The specific objectives of the electronic ruggedization have been accomplished. Analysis and breadboard tests indicate that the display unit will operate with good margins over the temperature range of -20 to +55C continuously and with intermittent operation of up to 30 minutes at 71C. (Author)

AD-786 234/5GA PC$4.25/MF$2.25
IBM Federal Systems Div Owego N Y Electronics Systems Center
DEFORMOGRAPHIC STORAGE DISPLAY TUBE (DSDT) APPLICATION FOR REAL-TIME MAP ANNOTATION.
Final rept. Mar 72-Dec 72,
Harold H. Bloem, Gunnar Nielsen, and B. James Ross. Mar 73, 67p Rept no. IBM-72-560-008
Contract N00014-71-C-0270
See also report dated 15 Jun 72, AD-744 689.

Descriptors: *Display systems, Projection, Maps, Optical equipment, Schlieren photography, Dielectrics, Membranes, Storage tubes, Images, Electrostatics, Real time, Airborne.
Identifiers: *Deformographic storage display tubes.

The report describes the investigation into the feasibility of using the Deformographic Storage Display Tube (DSDT) as a real-time annotation device for an airborne moving map projection system. The DSDT is a light valve display device which uses a Schlieren optical projection system to create a visual image from minute deformation on a dielectric membrane material within the tube. The basic problem with real-time annotation systems for airborne moving map units has been the difficulty of attaining light output and contrast from the annotation device sufficient to create visible imagery against the high light background created by the map projection light and the reflected ambient sunlight in the cockpit. The DSDT has the inherent capability to provide high contrast, high brightness imagery; and, because it

uses an optical system as a part of its image forming phenomenon, it can be readily integrated with a map projection unit. This study was primarily a laboratory investigation aimed at demonstrating the feasibility of the approach described above. The results of the investigation were favorable. Map annotation derived from the DSDT was visible against a background consisting of a 4300 fL map brightness and the reflected screen brightness from a 10,000 fc incident ambient light. Use of the DSDT could extend the use of the map projection surface for other aircraft display functions, thus creating a favorable cost effectiveness tradeoff for the additional equipment. (Author)

AD-906 687/9GA PC$4.25/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
MICROWAVE INTEGRATED CIRCUIT FILTER AND SCHIFFMAN LINE DESIGN.
Rept. for Jan-Jul 72,
P. F. Worcester. Oct 72, 69p NELC-TR-1832
Distribution Limitation now Removed.

Descriptors: *Integrated circuits, *Band pass filters, *Strip transmission lines, Band pass filters, Microwave equipment, Microwave frequency, Radiofrequency filters, Resonators, Coupling circuits, Impedance matching, Capacitance.
Identifiers: Computer aided design, Schiffman lines.

Microwave integrated circuit Schiffman lines were analyzed and computer-optimized to include the effects of the unequal even- and odd-mode velocities and the length of the coupling line that shorts the coupled lines. For the cases studied, standard stripline design techniques were not found to be sufficiently accurate. Microwave integrated circuit parallel-coupled resonator bandpass filters were analyzed and computer-optimized to include the effects of the unequal even- and odd-mode velocities and the foreshortening of the resonators due to fringing capacitance. For the cases studied, standard stripline synthesis techniques were found to give good results.

AD-906 734/9GA PC$3.75/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
MICROWAVE INTEGRATED CIRCUITS FOR LIGHTWEIGHT ARRAY ANTENNAS. I-BAND MIC COMPONENT DESIGN AND PERFORMANCE IN PHASED ARRAY ANTENNA MODULES AND OTHER MICROWAVE SYSTEMS.
Research and development rept. Jul 71-Jul 72,
P. F. Worcester, and D. Rubin. Aug 72, 37p
NELC-TR-1838
Distribution Limitation now Removed.

Descriptors: *Integrated circuits, Microwave equipment, Microwave frequency, Phased arrays, Radar antennas, Modules(Electronics), Alumina, Substrates, Ferrites, Power dividers, Weight, Antenna components, Coupling circuits.
Identifiers: I Band, Lightweight.

An investigation was conducted into I-band MIC component design and performance in phased array antenna modules and other microwave systems. Design and performance of several different MIC components at I-band are discussed. Results are presented for both equal and unequal power dividers, Butler matrices, 3-DB branchline couplers, 180 degrees 3-DB hybird couplers, isolators, ferrite phasors, and radiating elements. Performance adequate for many purposes is shown to have been obtained. Development of MIC amplifiers is recommended for use in modules with MIC components.

AD-907 958/3GA PC$5.25/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
HF AND VHF ANTENNA SYSTEM STUDY FOR AN LSD/LPD NEW SHIP DESIGN CONCEPT.
Technical document Jul 71-Jun 72,
H. K. Landskov. Sep 72, 113p NELC-TD-198
Distribution Limitation now Removed.

Descriptors: *Ship antennas, Communication and radio systems, High frequency, Very high frequency, Landing craft, Antenna radiation patterns, Antenna feeds, Radio receivers, Transmitter receivers, Transmission lines, Electricial impedance, Standing wave ratios, Communication equipment.
Identifiers: LPD class vessels, LSD class vessels.

This report presents analyses, test results, and conclusions resulting from a study of the new LSD/LPD ship communications antenna system. The recommendations contained are based on a review of ship plans, ship communication requirements, equipment or equipment prototypes available to meet the requirements, and operational considerations. The chief conclusion is that ship communications effectiveness will be vastly improved if a more modern approach is taken to topside design.

AD-909 622/3GA PC$4.25/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
SHIPBOARD VHF/UHF ANTENNA DESIGN AND UTILIZATION CRITERIA.
Research and development rept. Jul 71-Aug 72,
M. S. Kvigne. 5 Jan 73, 67p NELC-TR-1853
Distribution Limitation now Removed.

Descriptors: *Ship antennas, Design, Communication and radio systems, Very high frequency, Ultrahigh frequency, Shipboard, Mathematical models, Mathematical analysis, Air, Power, Antenna radiation patterns, Statistical analysis.
Identifiers: Intermodulation, Ship to air, Ship to ship, Tradeoffs.

This report presents a technique which enables the antenna design engineer to establish his own design and location criteria and the associated trade-offs and to analyze existing circuits. Conclusions are drawn about shipboard antenna design and location for the ship-to-ship case (example: Ship antenna height has little effect on circuit performance at low VHF frequencies); The ship-to-air case (high ship antennas and the highest frequencies produce detection contours with large amounts of lobing and the shortest distances of satisfactory performance); and The general case (high time availabilities require large protection biases to achieve the desired performance). An appendix indicates the effect of a complex shipboard environment upon a sample receiving system.

MLM-2045 PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.
MECHANICAL HANDLING AND PRECISION POSITIONING OF ULTRAFINE GOLD WIRE.
T. K. Ferguson. 15 Jul 74, 12p
Contract AT(33-1)-Gen-53

Descriptors: (*Microelectronic circuits, *Fabrication), Bonding, Electronic equipment, Gold, Materials handling, Mechanical properties, Wires.

For abstract, see NSA 30 08, number 23421.

N74-29498/4GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AN INTEGRAL EQUATION FORMULATION FOR PREDICTING RADIATION PATTERNS OF A SPACE SHUTTLE ANNULAR SLOT ANTENNA.
J. E. Jones, and J. H. Richmond. Aug 74, 81p
NASA-TN-D-7594, L-9279
Contract NGL-36-008-138
Subm-Prepared in Cooperation with Ohio State Univ.

Descriptors: *Space shuttle orbiters, *Spacecraft antennas, *Ultrahigh frequencies, *Very high frequencies, Antenna radiation patterns, Electromagnetic properties, Slot antennas.

For abstract, see STAR 1219

N74-29559/3GA PC$4.25/MF$2.25
Technische Universitaet, Munich (West Germany).
PARAMETRIC OSCILLATIONS IN HIGH FREQUENCY TRANSISTOR POWER AMPLIFIERS CAUSED BY NONLINEAR REACTANCE PARASITAERE SCHWINGUNGEN IN HOCHFREQUENZ TRANSISTOR-LEISTUNGSVERSTAERKERN HERVORGERUFEN DURCH NICHTLINEARE REAKTANZ.
Ph.D. Thesis.
D. R. Lohrmann. 1 Feb 73, 23p
Language in German.

Descriptors: *Surges, *Transient oscillations, *Transistor amplifiers, High frequencies, Numerical analysis, Ohmic dissipation, Power amplifiers.

For abstract, see STAR 1219

N74-29560/1GA PC$11.50/MF$2.25
Technische Universitaet, Hanover (West Germany).
BANDWIDTH OPTIMIZATION FOR NEGATIVE FEEDBACK NONRECIPROCAL MIXING CIRCUIT AMPLIFIERS WITHOUT CIRCULATOR DIE OPTIMIERUNG DER BANDBREITE GEGENGEKOPPELTER NICHTREZIPROKER PARAMETRISCHER MISCHERKETTEN-VERSTAERKER OHNE ZIRKULATOR.
Ph.D. Thesis.
H. Fischer. 1973, 169p
Language in German.

Descriptors: *Bandwidth, *Optimization, *Parametric amplifiers, Feedback circuits, Linear amplifiers, Mixing circuits, Negative feedback.

For abstract, see STAR 1219

N74-29562/7GA PC$5.50/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
LIGHTWEIGHT 3.66-METER-DIAMETER CONICAL MESH ANTENNA REFLECTOR.
D. M. Moore. 15 Jun 74, 47p NASA-CR-139219, JPL-TM-33-685
Contract NAS7-100

Descriptors: *Antenna design, *Computer programs, *Conical bodies, Structural engineering, Transmission lines.

For abstract, see STAR 1219

N74-29566/8GA PC$9.50/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
NOISE IN IMPATT-DIODE OSCILLATORS.
Ph.D. Thesis.
J. J. Goedbloed. 1973, 130p

Descriptors: *Avalanche diodes, *Electrical properties, *Electromagnetic noise, *Microwave oscillators, Amplitude modulation, Frequency modulation, Radio frequency interference.

For abstract, see STAR 1219

N74-29569/2GA PC$9.75/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
NOISE IN IMPATT-DIODE OSCILLATORS.
J. J. Goedbloed. 6 Nov 73, 131p

Descriptors: *Avalanche diodes, *Electromagnetic noise, *Oscillators, Models, Signal to noise ratios.

For abstract, see STAR 1219

N74-29570/0GA PC$7.00/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
DESIGN, DEVELOPMENT, AND FABRICATION OF A ELECTRONIC ANALOG

MICROMINIATURIZED ELECTRONIC ANALOG SIGNAL TO DISCRETE TIME INTERVAL CONVERTER.
A. D. Schoenfeld, and K. K. Schuegraf. Aug 73, 78p NASA-CR-120905
Contract NAS3-16797

Descriptors: *Analog to digital converters, *Computer design, Integrated circuits, Nichrome (Trademark), Pulse modulation, Temperature.

For abstract, see STAR 1219

N74-29572/6GA PC$4.00/MF$2.25
Ohio State Univ., Columbus.
MUTUAL IMPEDANCE OF NONPLANAR-SKEW SINUSOIDAL DIPOLES.
J. H. Richmond, and N. H. Geary. Aug 74, 13p NASA-CR-138310, ESL-2902-18
Contract NGL-36-008-138

Descriptors: *Antenna design, *Dipole antennas, *Electromagnetic properties, *Monopole antennas, Computer programs, Electrical impedance, Electrical properties, Numerical analysis.

For abstract, see STAR 1219

N74-29574/2GA PC$6.50/MF$2.25
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
MICROSTRIP ANTENNA STUDY FOR PIONEER SATURN/URANUS ATMOSPHERE ENTRY PROBE.
E. A. Kuhlman. May 74, 69p NASA-CR-137513
Contract NAS2-7328

Descriptors: *Antenna radiation patterns, *Atmospheric entry, *Pioneer space probes, Antenna design, Parameterization, Resonant frequencies.

For abstract, see STAR 1219

N74-29579/1GA PC$10.00/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
DESIGN PARAMETERS FOR TOROIDAL AND BOBBIN MAGNETICS.
W. T. Mclyman. 1 Jul 74, 139p NASA-CR-139248, JPL-TM-33-651-REV-1
Contract NAS7-100
Misc-Revised.

Descriptors: *Independent variables, *International system of units, *Magnetic properties, *Toroids, Conversion tables, Electromagnetic measurement, Nomographs, Units of measurement.

For abstract, see STAR 1219

N74-29597/3GA PC$12.25/MF$2.25
Radio Corp. of America, Somerville, N.J. Solid State Div.
PROCESS DEVELOPMENT OF BEAM-LEAD SILICON-GATE COS/MOS INTEGRATED CIRCUITS.
Final Report, 9 Nov. 1970 - 31 Dec. 1973.
B. Baptiste, and W. Boesenberg. Jan 74, 185p NASA-CR-120332
Contract NAS8-26594

Descriptors: *Aluminum oxides, *Beam leads, *Integrated circuits, *Metal oxide semiconductors, Chips, Dielectrics, Hermetic seals.

For abstract, see STAR 1219

N74-29599/9GA PC$12.75/MF$2.25
Technische Universitaet, Brunswick (West Germany).
THEORETICAL AND PRACTICAL STUDIES ON A FREQUENCY ANALOG SPEED CONTROL WITH ALTERNATING CURRENT INVERTER CONTROLLED ASYNCHRONOUS MACHINE THEORETISCHE UND PRAKTISCHE UNTERSUCHUNG EINER FREQUENZANALOGEN DREHZAHLREGELUNG MIT WECHSELRICHTERGESPEISTER ASYNCHRONMASCHINE.
Ph.D. Thesis.
H. Kalis. 1972, 191p
Language in German.

Descriptors: *Frequency converters, *Phase locked systems, *Rotating electrical machines, Alternating current, Digital filters, Inverters, Signal to noise ratios.

For abstract, see STAR 1219

N74-29601/3GA PC$11.00/MF$2.25
Toulouse Univ. (France).
CONTRIBUTION OF THE THEORY OF CONTROL SYSTEMS CONTAINING RECTIFYING THYRISTORS CONTRIBUTION A LA THEORIE DES SYSTEMES DE COMMANDE COMPRENANT UN REDRESSEUR A THYRISTORS.
Ph.D. Thesis.
P. Thierry. 2 Jul 73, 159p
Language in French.

Descriptors: *Circuit diagrams, *Feedback control, *Thyristors, Discrete functions, Power amplifiers, Signal transmission.

For abstract, see STAR 1219

N74-30569/9GA PC$6.00/MF$2.25
Technische Universitaet, Brunswick (West Germany).
CONTRIBUTION TO THE N-PATH-FILTER THEORY BEITRAG ZUR THEORIE DER N-PFAD-FILTER.
Ph.D. Thesis.
G. Reinhold. 1973, 58p
Language in German.

Descriptors: *Bandpass filters, *Frequency modulation, *Transfer functions, Fourier series, Network analysis, Signal to noise ratios, Switching theory.

For abstract, see STAR 1220

N74-30570/7GA PC$7.75/MF$2.25
Technische Universitaet, Brunswick (West Germany).
PRODUCTION AND NOISE BEHAVIOR OF X-BAND GUNN OSCILLATORS OF SANDWICH CONSTRUCTION HERSTELLUNG AND RAUSCHVERHALTEN VON X-BAND GUNN-OSZILLATOREN IN SANDWICH -BAUWEISE.
Ph.D. Thesis.
A. Ataman. 1973, 95p
Language in German.

Descriptors: *Gunn effect, *Oscillators, *Sandwich structures, Gallium arsenides, Heat transmission, Laminates, Production engineering, Signal to noise ratios.

For abstract, see STAR 1220

N74-30573/1GA PC$13.25/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
THE NASA/JPL 64-METER-DIAMETER ANTENNA AT GOLDSTONE, CALIFORNIA: PROJECT REPORT, TECHNICAL STAFF, TRACKING AND DATA ACQUISITION ORGANIZATION.
15 Jul 74, 203p NASA-CR-139385, JPL-TM-33-671
Contract NAS7-100

Descriptors: *Antenna design, *Deep space network, *Space communication, *Steerable antennas, Data acquisition, Solar system, Space exploration, Spacecraft tracking.

For abstract, see STAR 1220

N74-30575/6GA PC$6.75/MF$2.25
Varian Associates, Palo Alto, Calif. Tube Div.
DESIGN, CONSTRUCTION AND EVALUATION OF A 12.2 GHZ, 4.0 KW-CW HIGH EFFICIENCY KLYSTRON AMPLIFIER.
Final Report.
J. M. Vishida, and L. K. Brodersen. Aug 74, 74p NASA-CR-134659
Contract NAS3-13276

Descriptors: *Amplifiers, *Klystrons, Broadcasting, Harmonics, Microwave equipment, Radio frequencies, Space charge, Television equipment, Transmitters.

For abstract, see STAR 1220

N74-30593/9GA PC$10.00/MF$2.25
Erlangen-Nuremberg Univ. (West Germany).
ON THE FREQUENCY MULTIPLICATION ALONG SCHOTTKY TRANSMISSION CONTACTS UEBER DIE FREQUENZVERVIELFACHUNG LAENGS SCHOTTKY KONTAKT LEITUNGEN.
Ph.D. Thesis.
W. Rabus. 1973, 139p
Language in German.

Descriptors: *Frequency multipliers, *Schottky diodes, *Traveling wave amplifiers, Aluminum, Semiconducting films, Shock waves, Silicon, Transmission lines.

For abstract, see STAR 1220

PAT-APPL-491 413 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
REAL TIME LIQUID CRYSTAL IMAGE CONVERTER.
Patent Application.
J. B. Robertson. Filed 24 Jul 74, 8p NASA-CASE-LAR-11206-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Image converters, *Liquid crystals, *Real time operation, Imaging techniques, *Patent applications, Photoconductors.

A liquid crystal image converter that allows viewing while the image is being recorded in real time is presented. The converter is comprised of an opaque layer inserted between the liquid crystal layer and the photoconductor layer for shielding the photoconductor layer from the light for viewing the image formed in the liquid crystal layer, and for allowing an electric current to flow through the opaque layer whereby the image in the crystal can be viewed while it is being formed without interfering with the image forming process. This device is used to convert a nonvisible image, in the infrared or ultraviolet, into a visible image.

PAT-APPL-491 419 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
HORN ANTENNA HAVING V-SHAPED CORRUGATED SLOTS.
Patent Application.
C. A. Mentzer, and L. Peters, Jr.. Filed 24 Jul 74, 8p NASA-CASE-LAR-11112-1
Contract NASW-2501
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antenna design, *Corrugating, *Horn antennas, Aerospace engineering, *Patent applications, Slot antennas.

The development of a corrugated horn antenna in which the corrugated surfaces of the antenna are formed by V-shaped slots was reported. The depth

of the slots is between 0.3125 and 0.625 wavelengths. For this range of depths the surface impedance is capacitive and operates in a cut-off mode. The V-shaped corrugated slots are more easily machined than previous slots and the resulting antenna is readily adaptable to unfurlable antennas for space applications.

PATENT-3 792 423 Not available NTIS
Atomic Energy Commission, Washington, D. C.
ISOMETRIC IMAGING SYSTEM.
Patent,
Frederick L. Becker, and Richard L. Trantow.
Filed 24 May 72, patented 12 Feb 74, 8p PAT-APPL-256 300
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: *Three dimensional display systems, *Patents, Display devices, Images, Ultrasonic frequencies.
Identifiers: *Isometric imaging systems, PAT-CL-340-5-MP, Ultrasonics.

The patent describes an isometric imaging system for effecting the projection of a three-dimensional coordinate system onto the horizontal and vertical plane of a conventional display scope. The system provides for displaying both spatial and depth information by the novel transformation of the time coordinates of the scanned field, which contains the object to the horizontal and vertical coordinates of the display scope. In one embodiment a novel sample and hold circuit is provided for processing data on tapes at playback factors greater than 10.

PATENT-3 826 964 Not available NTIS
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
DIGITAL SERVO CONTROLLER.
Patent.
F. Byrne. Patented 30 Jul 74, 7p PAT-APPL-374 583
Misc-Filed 28 Jun. 1973 Supersedes N73-27153 (11 - 18, p 2122).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Antenna components, *Rotating shafts, *Servocontrol, Digital systems, *Patents, Pointing control systems.
Identifiers: PAT-CL-318-602.

A system, for generating a signal to control the rotation of a shaft supporting an antenna so that the antenna is rotated the shortest angular distance from a present angular position to a new desired angular position, was described. The system comprises a shaft encoder which generates a digital encoder signal indicating the present position of the shaft. A command signal is compared with the encoder signal to produce an analog signal for rotating the antenna. An error signal is produced for controlling the direction of rotation of the antenna.

SAND-74-0009 PC$5.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
BIBLIOGRAPHY: SANDIA LABORATORY HYBRID MICROCIRCUIT AND RELATED THIN FILM TECHNOLOGY.
C. M. Tapp, and R. K. Traeger. Jun 74, 40p
Contract AT(29-1)-789

Descriptors: (*Microelectronic circuits, *Bibliographies), (*Microelectronics, Bibliographies), (*Nuclear weapons, Microelectronic circuits).

For abstract, see NSA 30 08, number 21300.

SLA-73-1063 PC$6.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.; Bendix Corp., Kansas City, Mo.
REVIEW OF HYBRID MICROELECTRONICS.
C. M. Tapp, and T. A. Wiley. Jun 74, 65p
Contract AT(29-1)-789

Descriptors: (*Microelectronic circuits, *Reviews), (*Nuclear weapons, Microelectronic circuits), Fabrication, Reliability.

For abstract, see NSA 30 08, number 23479.

SLA-74-0300 PC$14.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
COMPILATION OF SPECIFICATIONS DESCRIBING HYBRID MICROCIRCUIT TECHNOLOGY.
C. M. Tapp, and D. J. Sharp. Jun 74, 218p
Contract AT(29-1)-789

Descriptors: (*Microelectronic circuits, *Fabrication), Design, Specifications.

For abstract, see NSA 30 08, number 23483.

SLA-74-0333 PC$8.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
HYBRID MICROCIRCUIT DESIGN GUIDE.
Jul 74, 97p

Descriptors: (*Electronic circuits, *Design).

For abstract, see NSA 30 08, number 23484.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

N74-29411/7GA PC$4.75
New Mexico Univ., Albuquerque. Energy Information Center.
HYDROGEN ENERGY: A BIBLIOGRAPHY WITH ABSTRACTS. CUMULATIVE VOLUME, 1953 - 1973.
K. E. Cox. 1 Jan 74, 633p NASA-CR-138940, TAC-H-74-500
Subm-Sponsored by NASA.

Descriptors: *Bibliographies, *Energy policy, *Hydrogen-based energy, Abstracts, Energy sources, Energy technology, Hydrogen fuels.

For abstract, see STAR 1219

N74-30378/5GA PC$4.00
National Aeronautics and Space Administration, Washington, D.C.
ENERGY: A CONTINUING BIBLIOGRAPHY WITH INDEXES, MAY 1974.
May 74, 78p NASA-SP-7043(01)

Descriptors: *Bibliographies, *Energy consumption, *Energy sources, *Energy technology, Energy conversion, International cooperation, Resources management.

For abstract, see STAR 1219

ORNL-EIS-74-52(Vol.2)(No.3) PC$5.25/MF$2.25
Oak Ridge National Lab., Tenn.
NSF-RANN ENERGY ABSTRACTS. A MONTHLY ABSTRACT JOURNAL OF ENERGY RESEARCH.
M. P. Guthrie. Mar 74, 42p
Contract W-7405-eng-26

Descriptors: (*Energy, *Bibliographies), Abstracts, Electric power, Energy conservation, Energy policy, Environment, Power generation, Power transmission.

For abstract, see NSA 30 08, number 23263.

PB-235 487/6GA PC$8.50/MF$2.25
Illinois Univ., Urbana. Center for Advanced Computation.
ENERGY USE IN THE COMMERCIAL AND INDUSTRIAL SECTORS OF THE U.S. ECONOMY, 1963.
Research rept.,
Clark W. Bullard, III, and Robert A. Herendeen.
21 Nov 73, 266p UIUC-CAC-DN-73-105
NSF/RA/N-74-057
Grant NSF-GI-35179X

Descriptors: *Industries, *Fuel consumption, Energy, Industries, Tables(Data), Commercial buildings, United States, Demand(Economics).
Identifiers: *Energy consumption, Input output analysis, *Electric power consumption.

This report presents detailed analyses of energy use in the 368 commercial and industrial sectors of the U. S. economy in 1963, and of intersector dependence in energy terms. Besides direct use, full attention is paid to the flow of non-energy goods and the energy thereby implied. The approach, which is based on energy input-output analysis, is described.

PB-235 817/4GA PC$5.25/MF$2.25
Combustion Power Co., Inc., Menlo Park, Calif.
ENERGY CONVERSION FROM COAL UTILIZING CPU-400 TECHNOLOGY.
Monthly progress rept. Jul-Aug 73.
Oct 73, 102p
Contract DI-14-32-0001-1536

Descriptors: *Coal, *Gas turbine power generation, *Fluidized bed processors, Combustion, Dolomite(Rock), Revisions, Tests, Feeders, Combustion products.
Identifiers: CPU 400 coal combustion.

Progress on modification of the CPU-400 (coal combustion unit) pilot plant is discussed. The plant, constructed to convert heat energy of solid waste to electrical energy through use of a gas turbine/generator, is being modified to accept coal as the energy source. Report covers installation of coal processing and feed systems and experiments demonstrating the viability of the direct coal-fired gas turbine approach using CPU-400 technology.

10B. Power Sources

AD-785 948/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
GEOTHERMAL POWER STATION.
29 Mar 74, 7p Rept no. FSTC-HT-23-1674-73
Trans. of Tekhnika-Molodezhi (USSR) n1 p4-5 1973.

Descriptors: *Thermal power plants, *Geothermy, Turbines, Fluorohydrocarbons, Heat pipes, Translations, USSR.

The article mentions a geothermal power plant in Kamachatka using 200-300 degrees steam as the power source, at an efficiency of about 10%. It further mentions an extensive geothermal field in Kamchatka, with a water temperature of 80-90C, in which the exhaust steam heats freon, which runs a secondary generator. Creation of an artificial magma chamber with a 100 megaton thermonuclear device is proposed, to supply a geothermal power plant by means of heat pipes.

AD-786 046/3GA PC$7.50/MF$2.25
Westinghouse Electric Corp Lima Ohio Aerospace Electrical Div
HIGH TEMPERATURE GENERATOR COMPONENT DEVELOPMENT.
Final technical rept. May 72-Jun 74,
Robert C. Fear, Allen E. King, and William E. Neff. Aug 74, 240p AFAPL-TR-74-69
Contract F33615-72-C-1626
See also AD-752 604.

Descriptors: *Electric generators, Aircraft equipment, Magnetic materials, Semiconductor diodes, Silicon carbides, Bearings, Electrical insulation, Coils, High temperature.
Identifiers: Design.

Investigations of high temperature generator designs and generator components such as insulations, magnetic materials, diodes, and bearings for operation in a 600 F high altitude ambient are described. Interlaminar insulation coatings for cobalt iron magnetic sheet steels were investigated and best choices are identified. A new coil insulation system in the form of a rugged monolithic structure was developed using a new ceramic tape and an encapsulation of a compound of commercial glass. Dry lubricated bearing technology developments were extended to more than double the life over previous similar bearings. High temperature SiC diode technology developments were extended to more than double the rating over prior SiC diodes. A conceptual design of a lighter weight, higher power density synchronous generator utilizing these new components is presented having a specific weight of 2.3 lbs/kVA. (Author)

IESD-3112-1 PC$14.00/MF$2.25
Teledyne Isotopes, Timonium, Md. Energy Systems Div.
ECONOMIC RADIOISOTOPE THERMOELECTRIC GENERATOR STUDY PROGRAM. FINAL TECHNICAL REPORT.
Oct 73, 216p
Contract SNSO-3

Descriptors: (*Thermoelectric generators, *Design), (*Satellites, *Power supplies), (*Curium 244, Thermoelectric generators), Communications, Plutonium 238.

For abstract, see NSA 30 08, number 20917.

IESD-3112-2 PC$20.50/MF$2.25
Teledyne Isotopes, Timonium, Md. Energy Systems Div.
ECONOMIC RADIOISOTOPE THERMOELECTRIC GENERATOR STUDY PROGRAM. APPENDICES. FINAL TECHNICAL REPORT.
Oct 73, 350p
Contract SNSO-3

Descriptors: (*Thermoelectric generators, *Design), (*Satellites, *Power supplies), (*Curium 244, Thermoelectric generators), Communications, Performance, Plutonium 238.

For abstract, see NSA 30 08, number 20918.

IESD-3112-3 PC$10.50/MF$2.25
Teledyne Isotopes, Timonium, Md. Energy Systems Div.
ECONOMIC RADIOISOTOPE THERMOELECTRIC GENERATOR STUDY PROGRAM. PROGRAM PLAN.
Nov 73, 149p
Contract SNSO-3

Descriptors: (*Thermoelectric generators, *Design), (*Satellites, *Power supplies), (*Curium 244, Thermoelectric generators), Communications, Planning, Plutonium 238.

For abstract, see NSA 30 08, number 20919.

IESD-3112-4 PC$6.00/MF$2.25
Teledyne Isotopes, Timonium, Md. Energy Systems Div.
ECONOMIC RADIOISOTOPE THERMOELECTRIC GENERATOR STUDY PROGRAM. COST EFFECTIVENESS STUDY.
Nov 73, 57p
Contract SNSO-3

Descriptors: (*Thermoelectric generators, *Design), (*Satellites, *Power supplies), (*Curium 244, Thermoelectric generators), Communications, Economics, Plutonium 238.

For abstract, see NSA 30 08, number 20920.

N74-29413/3GA PC$4.50/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
DEVELOPMENT OF A UNINTERRUPTED POWER SYSTEM: AC AND DC TO DC CONVERTER.
D. L. Cronin, and A. D. Schoenfeld. Jul 73, 30p
NASA-CR-134497
Contract NAS3-15827

Descriptors: *Electric power supplies, *Silicon controlled rectifiers, *Voltage converters (Dc to dc), Circuit protection, Electrical engineering, Technology utilization.

For abstract, see STAR 1219

N74-29417/4GA PC$4.00/MF$2.25
Linguistic Systems, Inc., Cambridge, Mass.
SEA'S EXAMINATION OF WINDPOWER IN 1952: CHANGE OF A WIND POWER MILL FROM DIRECT CURRENT TO ALTERNATING CURRENT PRODUCTION.
J. Juul. Jul 74, 19p NASA-TT-F-15439
Contract NASW-2482
Tran-Transl. Into English from Elektroteknikeren (Copenhagen), No. 10, 22 May 1953 p 193-197.

Descriptors: *Alternating current, *Production engineering, *Windmills (Windpowered machines), Current converters (Ac to dc), Electric power supplies, Energy sources, High voltages, Windpowered generators.

For abstract, see STAR 1219

N74-29564/3GA PC$12.00/MF$2.25
Toulouse Univ. (France).
CONTRIBUTION OF THE STUDY OF DIRECT CURRENT CONVERTERS AND ALTERNATE CURRENT TRANSISTORS CONTRIBUTION A L'ETUDE DES CONVERTISSEURS CONTINU-CONTINU ET ALTERNATIF-CONTINU A TRANSISTORS.
Ph.D. Thesis.
H. Cammas. 1973, 176p
Language in French.

Descriptors: *Alternating current, *Converters, *Direct current, *Power gain, *Transistors, Electric equipment, Feedback circuits, Power supplies.

For abstract, see STAR 1219

N74-30157/3GA PC$10.50/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
RELAXATION PHENOMENA IN AN MHD GENERATOR WITH PRE-IONIZER.
Ph.D Thesis.
J. H. Blom. 11 Sep 73, 146p

Descriptors: *Magnetohydrodynamic generators, *Relaxation (Mechanics), Electrostatic probes, Enthalpy, Power efficiency, Shock tunnels.

For abstract, see STAR 1219

N74-30158/1GA PC$11.25/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
LOSS MECHANISMS IN AN MHD GENERATOR.
Ph.D Thesis.
J. W. M. A. Houben. 25 Sep 73, 164p

Descriptors: *Energy dissipation, *Magnetohydrodynamic generators, Boundaries, Electrostatic probes, Energy conversion, Energy conversion efficiency, Hot-film anemometers, Piezoelectric crystals.

For abstract, see STAR 1219

N74-30445/2GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TRANSPORT DYNAMICS OF A HIGH-POWER-DENSITY MATRIX-TYPE HYDROGEN-OXYGEN FUEL CELL.
P. R. Prokopius, and N. H. Hagedorn. Aug 74, 19p
NASA-TN-D-7757, E-7876

Descriptors: *Hydrogen oxygen fuel cells, *Transport properties, Electrodes, Electrolytic cells, Humidity measurement.

For abstract, see STAR 1220

N74-30574/9GA PC$7.25/MF$2.25
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
DEVELOPMENT OF A GAS PRESSURE BONDED FOUR-POLE ALTERNATOR ROTOR.
Final Report.
G. G. Lessmann, and W. A. Bryant. Apr 72, 81p
NASA-CR-120923, WANL-M-FR-72-002
Contract NAS3-11837

Descriptors: *Gas pressure, *Pressure welding, *Steels, *Welded joints, Heat treatment, Magnetic properties, Rotors.

For abstract, see STAR 1220

PAT-APPL-495 021 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Pasadena Office, Calif.
HIGH VOLTAGE, HIGH CURRENT SCHOTTKY BARRIER SOLAR CELL.
Patent Application.
R. J. Stirn. Filed 5 Aug 74, 15p NASA-CASE-NPO-13482-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Barrier layers, *High current, *High voltages, *Schottky diodes, *Solar cells, Electric contacts, Metal films, *Patent applications, Semiconductor devices, Substrates.

A Schottky barrier solar cell is described which consists of a layer of wide band gap semiconductor material on which a very thin film of semitransparent metal is deposited to form the barrier. The layer of the wide band gap semiconductor material is on top of a layer of narrower band gap semiconductor material, to which one of the cell's contacts may be attached directly, or through a substrate. The cell's other contact is a grid structure which is deposited on the thin metal film.

PATENT-3 794 527 Not available NTIS
Atomic Energy Commission, Washington, D.C.
THERMOELECTRIC CONVERTER.
Patent,
Chang-Kyo Kim. Filed 15 Jan 70, patented 26 Feb 74, 3p PAT-APPL-3 183
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Thermoelectric generators, *Patents, Thermoelectric materials, Pellets, Tubes.
Identifiers: PAT-CL-136-208.

The patent relates in general to thermoelectric units and more particularly to a tubular thermoelectric unit which includes an array of tandemly arranged radially tapered annular thermoelectric pellets having insulation material of a lower density than the thermoelectric pellets positioned between each pellet.

PB-234 860/5GA PC$5.25/MF$2.25
Jet Propulsion Lab., Pasadena, Calif.
WORKSHOP PROCEEDINGS: PHOTOVOLTAIC CONVERSION OF SOLAR ENERGY FOR TERRESTRIAL APPLICATIONS. VOLUME I.

WORKING GROUP AND PANEL REPORTS HELD AT CHERRY HILL, N.J. ON 23-25 OCTOBER 1973.
Oct 73, 112p* NSF/RA/N-74-013-1, NASA-CR-138209
Contract NAS7-100, Grant NSF-AG-485
See also Volume 2, PB-234 861.

Descriptors: *Photovoltaic cells, *Meetings, Solar cells, Silicon, Single crystals, Polycrystals, Insolation, Tests, Performance evaluation, Costs, Project planning, Solar energy.

The Workshop on Photovoltaic Conversion of Solar Energy for Terrestrial Applications was called in recognition of the pressing need for the exchange of information among researchers in this field and to promote a dialogue between researchers and representatives of manufacturing, marketing, government and utilities. The proceedings of this Photovoltaic Workshop have been published in two volumes. The first volume covers the introductory remarks by NSF, the working group summaries and discussions, and the panel discussions. Volume II encompasses the five sessions of technical presentations and discussions. The agenda for the entire three-day workshop and the list of attendees can be found at the back of Volume I.

PB-234 861/3GA PC$8.75/MF$2.25
Jet Propulsion Lab., Pasadena, Calif.
WORKSHOP PROCEEDINGS: PHOTOVOLTAIC CONVERSION OF SOLAR ENERGY FOR TERRESTRIAL APPLICATIONS. VOLUME II. INVITED PAPERS HELD AT CHERRY HILL, N.J. ON 23-25 OCTOBER 1973.
Oct 73, 294p* NSF/RA/N-74-013-2, NASA-CR-138193
Grant NSF-AG-485
See also Volume 1, PB-234 860.

Descriptors: *Photovoltaic cells, *Meetings, Solar cells, Silicon, Single crystals, Polycrystals, Thin films, Solar energy.
Identifiers: Schottky barrier devices, Photogaivanic cells.

Technical presentations and discussions of a workshop on terrestrial applications of solar energy are presented. Topic areas cover systems and diagnostics, cadmium sulfide/copper sulfide thin film cells, single crystal and polycrystalline silicon, and other materials and devices.

PB-235 587/3GA PC$7.25/MF$2.25
Kellogg (M.W.) Co., Piscataway, N.J. Research and Development Center.
COMBINED DESALINATION AND POWER GENERATION USING COAL ENERGY. PHASE I REPORT. SITE SELECTION AND ESTIMATED WATER COSTS BASED ON CURRENT TECHNOLOGY.
Interim rept. Jun 65-Aug 66.
Aug 66, 218p OCR-25-INT-1
Contract DI-14-01-0001-481
See also PB-174 938

Descriptors: *Desalting, *Coal, *Steam electric power generation, Sea water, Brackish water, Capitalized costs, Operating costs, Cost estimates, Plant location, Feasibility, Water resources, Electric power plants.
Identifiers: *Multistage flash distillation, *Electrodialysis desalination.

The report describes the results of a study of coal as an energy source for producing fresh water from salt and brackish water. Both dual-purpose plants (generating useful electricity in addition to producing fresh water by evaporation) and electrodialysis single- purpose water plants are considered. These are the present 'state-of-the-art' desalination methods to which this Phase I study was restricted. The report examines in some detail water requirements of the United States, availability of coal, brackish and salt water, and the capital and operating costs of desalination, steam generation, and the generation of electrical power.

SLA-74-5078 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
AXIAL TEMPERATURE DIFFERENTIAL ANALYSIS OF LINEAR FOCUSED COLLECTORS FOR SOLAR POWER.
D. O. Lee, and W. P. Jr. Schimmel. 7p CONF-740805-3

Descriptors: (*Solar collectors, *Performance), Fluid flow, Heat transfer, Temperature dependence, Turbulent flow.

For abstract, see NSA 30 08, number 23264.

10C. Energy Storage

AD-785 732/9GA PC$3.75/MF$2.25
Eagle-Picher Industries Inc Joplin Mo Couples Dept
LITHIUM-CARBON MONOFLUORIDE ORGANIC ELECTROLYTE MANPACK BATTERY.
Final rept. Jun 72-Jun 74,
Edward P. Broglio. Aug 74, 44p ECOM-72-0204-F
Contract DAAB07-72-C-0204

Descriptors: *Primary batteries, *Lithium, *Electrodes, *Graphite, Fluorides, Electrolytes, Reliability(Electronics), Fused salts.
Identifiers: Lithium cells, Graphite fluorine clathrates, Design, Organic batteries, High energy batteries.

The purpose of this contract was to conduct research and development leading to the design and construction of a long-life, organic electrolyte battery for manpack equipment. The requirements cover a high energy density primary lithium battery capable of good low temperature performance at high power levels.

AD-785 970/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
SEMICONDUCTING CHARGE-DISCHARGE DEVICES FOR STORAGE BATTERIES.
S. A. Volotkovskii, V. D. Fursov, and E. I. Sidorenko. 10 Apr 74, 11p Rept no. FSTC-HT-23-1788-73
Trans. of Mekhanizatsiya i Avtomatizatsiya Proizvodstva (USSR) n2 p14-16 1973.

Descriptors: *Storage batteries, *Semiconductor devices, *Battery chargers, Mines(Excavations), Translations, USSR, Electric batteries, Control systems.
Identifiers: *Mining equipment, Coal mines.

Discussed are storage battery semiconducting charge-discharge devices with three-phased bridge rectification for use on mine locomotives. Principle schematic given, plus schematic design for an automatic current stabilization circuit. Graph shows charge characteristics of typical storage batteries under tests in coal mines.

LA-5631-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
METHODS OF ENERGY TRANSFER FROM A MAGNETIC ENERGY STORAGE SYSTEM USING A TRANSFER CAPACITOR AND A SUPERCONDUCTING SWITCH.
D. M. Weldon, and J. D. G. Lindsay. May 74, 19p
Contract W-7405-eng-36

Descriptors: (*Switches, *Superconductors), (*Energy transfer, Switches), Capacitors, Electronic circuits, Energy storage.

For abstract, see NSA 30 08, number 22533.

N74-29412/5GA PC$4.00/MF$2.25
Gould, Inc., Mendota Heights, Minn. Energy Research.
FABRICATION AND TESTING OF NEGATIVE-LIMITED SEALED NICKEL-CADMIUM CELLS.
D. J. Gordy. 28 May 74, 11p NASA-CR-139374, REPT-732-015-3
Contracts NAS7-100, JPL-953680

Descriptors: *Electrical properties, *Nickel cadmium batteries, *Storage batteries, Equipment specifications, Performance tests, Product development.

For abstract, see STAR 1219

N74-29414/1GA PC$11.00/MF$2.25
Pennsylvania State Univ., University Park.
ELECTRODE KINETICS OF A WATER VAPOR ELECTROLYSIS CELL.
Final Report, 15 Aug. 1971 - 30 Jun. 1974.
G. Jacobs. Jul 74, 157p NASA-CR-139369
Contract NGR-39-009-123

Descriptors: *Electrochemical cells, *Electrodes, *Electrolysis, *Water vapor, Electric potential, Life support systems, Overvoltage.

For abstract, see STAR 1219

N74-29415/8GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THE NASA PROGRAM FOR STANDARDIZING SILICON SOLAR CELLS.
W. J. Bifano, and A. F. Forestieri. Aug 74, 3p NASA-TM-X-71563, E-7995
Conf-Presented at the 9TH Intersoc. Energy Conversion Eng. Conf., San Francisco, 26-30 Aug. 1974.

Descriptors: *Silicon, *Solar cells, *Standardization, Cost analysis, Feasibility analysis, Mission planning, Specifications.

For abstract, see STAR 1219

PAT-APPL-440 916 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ELECTROLYTIC CELL DESIGN.
Patent Application.
D. F. Putnam, and R. L. Vaughan. Filed 8 Feb 74, 10p NASA-CASE-LAR-11042-1
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electrolytic cells, *Platinum, *Sulfones, Metal bonding, *Patent applications, Rubber, Teflon (Trademark).

An electrolytic cell is made up of a stack of polysulfone plates faced with sheets of platinum bonded by silicone rubber and mechanically secured to their plates by Teflon screws having heads serving as spacers between opposed platinum sheets.

11. MATERIALS

11A. Adhesives and Seals

AD-785 963/0GA PC$8.75/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
GLUING TECHNOLOGY.
L. M. Kovalchuk. 15 Apr 74, 292p Rept no. FSTC-HT-23-0292-74
Trans. of mono. Tekhnologiya Sklеivanie Lesnaya Promyshlennost, Moscow, 1973 206p.

Descriptors: *Adhesive bonding, Bonded joints, Materials, Preparation, Adhesion, Translations, USSR.
Identifiers: *Glue, *Gluing.

Various types of glues, methods of gluing wood materials with them, and basic technological operations of the gluing process are considered in the book. Changes in glue properties in the process of their preparation and application on the sur-

faces being glued are considered. Procedures for preparation and application of glues on the surface of the materials being glued, the rate of hardening of glues depending on their composition, viscosity, heating temperatures, and also procedures for gluing wood to wood, to glass plastic and other materials are all presented. Factors which affect the strength of joints, the causes and nature of the formation of stresses in glued joints, the relationship of strength and longevity of glued joints to gluing methods and procedures are considered.

AD-785 986/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
ADHESIVES AND HERMATIC SEALS MADE OF SYNTHETIC MATERIALS,
E. I. Belskii, A. M. Dmitrovich, and E. B. Lozhechnikov. 24 Jul 74, 5p Rept no. FSTC-HT-23-1596-73
Trans. of mono. Novye Materialy v Tekhnike chap-13, (New Materials in Technology), Minsk, 1971 p245-249, by John F. Eros.

Descriptors: *Adhesives, *Hermetic seals, *Synthetic materials, Adhesive bonding, Polyurethane resins, Fillers, Joints, Translations, USSR.

UCID-16413 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
MIXING PROCEDURE FOR ADIPRENE L-315/POLYOL ADHESIVE.
H. G. Hammon. 3 Dec 73, 7p
Contract W-7405-Eng-48

Descriptors: (*Adhesives, *Production), Chemical properties, Health hazards, Mixing, Safety.

For abstract, see NSA 30 08, number 23378.

Y-1952 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
URETHANE ADHESIVES AS L-100/MOCA SUBSTITUTES.
F. G. Childress, C. E. Miller, and A. K. Zava. Aug 74, 23p
Contract W-7405-eng-26

Descriptors: (*Urethane, *Mechanical properties), (*Adhesives, Mechanical properties), Chemical reactions, Creep, Hardness, Temperature measurement, Tensile properties, Viscosity.

For abstract, see NSA 30 08, number 23437.

11B. Ceramics, Refractories, and Glasses

AD-785 717/0GA Reprint
Northwestern Univ Evanston Ill
SINTERING OF COO: I, INITIAL STAGE,
P. Kumar, and D. L. Johnson. 30 Aug 73, 5p
AROD-6730.9-MC
Contract DAHC04-67-C-0009
Presented at the American Ceramic Society Annual Meeting (74th) Washington, D.C. 9 May 72. Revision of report dated 13 Mar 73.
Availability: Pub. in Jnl. of The American Ceramic Society, v57 n2 p62-64 Feb 74.

Descriptors: *Cobalt compounds, *Sintering, Diffusion.
Identifiers: Cobalt oxides.

The initial-sintering kinetics of compacts of uniform spheres of CoO were investigated at various temperatures and O2 partial pressures. Volume-diffusion kinetics were exhibited initially, followed by retardation of sintering and deviation from the sintering model as a result of faceting of the spheres. The calculated volume diffusivities lie between those measured for Co and O in CoO. (Author)

AD-785 930/9GA PC$8.50/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
CERAMIC MATERIALS FOR AGRESSIVE MEDIA,
Petr Petrovich Budnikov, and Fridrich Yakoulevich Kharitonov. 29 Oct 73, 267p Rept no. FSTC-HT-23-24-73
Trans. of mono. Keramicheskie Materialy dlya Agressivnykh Sred, Moscow, 1971 267p.

Descriptors: *Ceramic materials, Corrosion, Corrosion resistance, Chemical attack(Degradation), Environments, Translations, USSR.

The book presents the theory of corrosion of ceramic materials, systemized bibliographical data, and a description of properties and resistance of ceramics in aggressive media. The book is intended to be used by engineers and scientific workers involved in the design and operation of equipment which operates in aggressive media; it is also useful for ceramic specialists. (Author)

AD-785 942/4GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
USE OF KAZAKHSTAN NONFERROUS METALLURGICAL SLAGS FOR THE PRODUCTION OF SLAG GLASS-CERAMICS,
Yu. A. Morkonrenkov, A. I. Nagornyi, and S. S. Takibaeva-Beloborodova. 10 Oct 73, 12p Rept no. FSTC-HT-23-1383-73
Trans. of Gosudarstvennyi Nauchno-Issledovatelskii Institut Stroitelnykh Materialov, Alma-Ata. Trudy (USSR) n9(11) p311-318 1969, by Markowitz.

Descriptors: *Slags, *Glass, *Ceramic materials, *Reclamation, Sulfur, Manganese, Copper, Zinc, Crystallization, Precipitation, Translations, USSR.
Identifiers: Waste recycling.

Glass-ceramics were prepared from slag melts during crystallization at 700-1500C. It was shown that glass-ceramics crystallized at 700-800C had a uniform fine-grained structure and high glass content (30-40%) and those crystallized at 800-900C often had a non-uniform grain structure. Increase in crystallization temperature to 950-1050C favored the formation of uniform structure with a minimum amount of glass (10-15%). The native elements (S, Mn, Cu, Zn) present in the slag acted as crystallization centers and promoted precipitation of the 1st crystal phase and its stabilization.

AD-786 079/4GA Reprint
Northwestern Univ Evanston Ill Dept of Materials Science
SINTERING OF COO: II. INTERMEDIATE STAGE,
P. Kumar, and D. L. Johnson. 30 Aug 73, 6p
AROD-6730.10-MC
Contract DAHC04-67-C-0009
Revision of report dated 13 Mar 73. Presented at the Annual Meeting of the American Ceramic Society (74th) Washington, D.C., 9 May 72 (Basic Science Div., No. 49-B-72).
Availability: Pub. in Jnl. of the American Ceramic Society, v57 n2 p65-68 Feb 74.

Descriptors: *Cobalt compounds, *Sintering, Diffusion, Oxides, Mass transfer, Grain boundaries.
Identifiers: *Cobalt oxides.

Dilatometry and stereology were used to study the intermediate-stage sintering of CoO as a function of O2 partial pressure and temperature. Volume-diffusion sintering kinetics were observed, but the diffusion coefficients calculated from the sintering data were between the values previously determined for Co and O using tracer techniques. Carbon dioxide retards mass transport. Grain growth and sintering are correlated; the grain-growth rate constant is approximately proportional to the sintering volume-diffusion coefficient. (Modified author abstract)

AD-786 097/6GA Reprint
Pennsylvania State Univ University Park Dept of Materials Science
EUTECTIC SOLIDIFICATION OF MGO-MGAL2O4,
F. L. Kennard, R. C. Bradt, and V. S. Stubican. 17 May 73, 6p AROD-8115.2-MC
Grant DA-ARO-D-31-124-73-G9
Presented at the Annual Meeting (74th), The American Ceramic Society, Washington, D.C., 8 May 72 (Basic Science Div., No. 23-B-72). Revision of report dated 28 Feb 73.
Availability: Pub. in Jnl. of the American Ceramic Society, v56 n11 p566-569 Nov 73.

Descriptors: *Solidification, *Refractory materials, *Magnesium oxides, Aluminates, Magnesium compounds, Eutectics, Microstructure, Orientation(Direction).
Identifiers: *Magnesium aluminates.

Directional solidification of the MgO-MgAl2O4 eutectic yields MgO whiskers in a spinel matrix. Microstructures produced at solidification rates of 0.4 to 30.0 cm/h were studied. The interlamellar spacing agrees with the inverse-square-root dependence on solidification rate. Colony-free microstructures formed in all ingots solidified at rates of <2.0 cm/h. For ingots solidified with planar growth, the orientation relation of the phases is given. (Modified author abatract)

AD-786 112/3GA Reprint
Lehigh Univ Bethlehem Pa
THE GRIFFITH CRITERION AND THE REVERSIBLE AND IRREVERSIBLE FRACTURE OF BRITTLE MATERIALS,
D. P. H. Hasselman, D. A. Krohn, R. C. Bradt, and J. A. Coppola. 1974, 9p AROD-10722.4-MC
Grant DA-ARO-D-31-124-73-G45
Availability: Pub. in Fracture Mechanics of Ceramics, v2 p749-755 n.d.

Descriptors: *Fracture(Mechanics), *Ceramic materials, Crack propagation, Brittleness, Fatigue(Mechanics).
Identifiers: Griffith cracks.

The Griffith criterion represents a necessary, but not sufficient condition for catastrophic fracture. Instead, a brittle material with a microcrack will have two values of critical fracture stress. The lower critical fracture stress which corresponds to the Griffith criterion for reversible fracture, represents the minimum stress level for slow crack growth by a reversible thermally activated process, i.e. the fatigue limit. The higher critical fracture stress corresponds to the stress required for irreversible catastrophic fracture, which requires an energy expenditure in excess of the surface free energy of the new crack surfaces even in the absence of energy dissipative processes, such as plastic flow at the crack tip. It is concluded that the surface free energy of a material cannot be measured by a fracture experiment. (Modified author abstract)

AD-786 231/1GA PC$3.75/MF$2.25
Solar San Diego Calif
STATIC FATIGUE OF CERAMIC MATERIALS.
Interim technical rept. no. 2, 30 Jan-30 Jun 74,
Mary E. Gulden, and Arthur G. Metcalfe. Jul 74, 41p Rept no. RDR-1778-2
Contract N00014-73-C-0401
See also AD-774 934.

Descriptors: *Sapphire, *Alumina, *Silicon nitrides, *Fatigue(Mechanics), *Creep strength, Moisture, Ph factor, High temperature, Grain boundaries.

Time-dependent failure in the temperature range ambient to 900C is being studied using variable strain rate and static load tests in four-point bending. The materials investigated are sapphire, alumina, hot pressed Si3N4 and reaction sintered Si3N4. The bulk of the work is being performed on the latter two materials. The test environment has

been varied to determine the effects of moisture and pH on time-dependent failure. All of the materials exhibited strain rate and/or time-dependent failures in this temperature range in an environment of flowing air, saturated with water at room temperature. The strength decrease is moisture-dependent and the decrease is more marked in the presence of acids. A theory is proposed for the mechanism of static fatigue of the polycrystalline materials. The theory is based on ion exchange occurring in the glassy grain boundary phase. (Modified author abstract)

AD-786 278/2GA Reprint
Systems Research Labs Inc Dayton Ohio
EFFECT OF AN SIC ADDITION ON THE OXIDATION OF ZRB2.
Journal article,
W. C. Tripp, H. H. Davis, and H. C. Graham. 26 Dec 72, 8p ARL-74-0055
Availability: Pub. in Ceramic Bulletin v52 n8 1973.

Descriptors: *Oxidation, *Silicon carbides, Zirconium compounds, Reaction kinetics, Interfaces, Diffusion, High temperature, Glass.
Identifiers: *Zirconium borides.

Gravimetric techniques and microstructural studies have been combined to define the effect of SiC on the oxidation of zirconium diboride. Studies were carried out at 250 torr oxygen pressure in the range 800-1500 degrees centigrade. The SiC phase begins oxidizing appreciably in the range 1100-1300 degrees, resulting in the formation of an SiO sub2-rich glassy layer which imparts significant improvement in the oxidation resistance of the diboride to higher temperatures. Reaction occurs at the matrix-oxide interface, with the reaction rate being controlled by diffusion through a protective scale. (Author)

AREAEE-184 PC$4.00/MF$2.25
Atomic Energy Establishment, Cairo (Egypt).
PRELIMINARY STUDIES OF VACUUM SINTERING OF UO SUB 2 .
N. A. Haroun, and K. A. El-Adham. 1973, 13p
U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Sintering), Compacts, Density, Powders, Time dependence, Very high temperature.

For abstract, see NSA 30 08, number 21509.

COM-74-50900/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MISCIBILITY GAP IN THE SYSTEM PBO-B203.
Final rept.,
J. H. Simmons. 1973, 2p
Pub. in Jnl. of the American Ceramic Society, v56 n5 p284-285 May 73.

Descriptors: *Lead glass, *Borates, Solubility, Melting, Temperature.

The immiscibility temperatures of lead-borate glasses are reported. The data indicate the existence of a PbO.4B2O3 structure in the melt. A fit of the data by a regular mixing equation leads to the calculation of miscibility gap and spinodal boundaries.

COM-74-50903/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INTERACTION OF MICROSTRUCTURE DEVELOPMENT WITH VISCOUS FLOW PROCESSES IN GLASS.
Final rept.,
Joseph H. Simmons, Susan A. Mills, and Albert Napolitano. Jan 74, 8p
Contract NAonr-12-73
Pub. in Jnl. of Non-Crystalline Solids, v14 p302-309 Jan 74.

Descriptors: *Glass, *Viscosity, Microstructure, Heat treatment, Phase.

Measurements in glasses undergoing phase separation showed a large increase of viscosity with heat-treatment time. A correlation of this effect with electron micrographs of the structure indicated that the change in viscosity was related to an increase in size of the microstructure. A theoretical analysis is presented which is based on a model relating point-to-point variations in molecular environments to viscous flow processes in glass.

EURFNR-1180 PC$4.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Material- und Festkoerperforschung.
METALLOGRAPHY OF URANIUM CARBIDES AND URANIUM–PLUTONIUM MIXED CARBIDES.
J. K. Ghosh, and D. Vollath. Mar 74, 20p KFK-1976
U.S. Sales Only.

Descriptors: (*Uranium carbides, *Metallography), Etching, Nuclear fuels, Phase studies, Plutonium carbides, Polishing.

For abstract, see NSA 30 08, number 21516.

GEPP-131 PC$4.00/MF$2.25
General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
ULTRASONIC DETECTION OF DEFECTS IN THIN CERAMIC CYLINDERS.
P. A. Fessler. 19 Jul 74, 9p
Contract AT(29-2)-656

Descriptors: (*Cylinders, *Ultrasonic testing), (*Ceramics, Ultrasonic testing), Defects.

For abstract, see NSA 30 08, number 23442.

JUL-1052-RW PC$4.50/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
PYROCARBON, AN IMPORTANT MATERIAL FOR HIGH TEMPERATURE GAS COOLED REACTORS.
E. Gyarmati, K. Koizlik, P. Krautwasser, H. Luhleich, and H. Nickel. Mar 74, 30p
U.S. Sales Only.

Descriptors: (*Pyrolytic carbon, *Reviews), Coated fuel particles, Deposition, Heat treatments, Physical properties, Physical radiation effects.

For abstract, see NSA 30 08, number 21835.

KFK-EXT-6/74-2 PC$6.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
STRUCTURE, PREPARATION, AND PROPERTIES OF REFRACTORY COMPOUNDS AND SYSTEMS.
H. Holleck, and F. Thuemmler. Apr 74, 70p
In German. U.S. Sales Only.

Descriptors: (*Refractories, *Chemical preparation), Carbonitrides, Hafnium compounds, Microstructure, Molybdenum carbides, Phase diagrams, Physical properties, Tantalum carbides, Tungsten carbides.

For abstract, see NSA 30 08, number 21522.

N74-30960/0GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
A METHOD OF MANUFACTURING REFRACTORY MATERIALS. PATENT APPLICATION.
K. Shimizu. Aug 74, 8p NASA-TT-F-15861
Contract NASW-2481
Tran-Transl. Into English of Japanese Patent Application No. 81789-1971, 29 Jun. 1973 p 499-502.

Descriptors: *Production engineering, *Refractory materials, *Silicates, *Synthetic resins, Construction materials, Japan, Mechanical properties, Patent policy.

For abstract, see STAR 1220

N74-31024/4GA PC$6.00/MF$2.25
Ceramic Finishing Co., State College, Pa.
IMPROVING IMPACT RESISTANCE OF CERAMIC MATERIALS BY ENERGY ABSORBING SURFACE LAYERS.
H. P. Kirchner, and J. Seretsky. Mar 74, 56p
NASA-CR-134644
Contract NAS3-17765

Descriptors: *Ceramics, *Energy absorption, *Impact tests, Anisotropy, Modulus of elasticity, Silicon carbides, Surface finishing, Thermal expansion.

For abstract, see STAR 1220

SGAE-2217 PC$4.00/MF$2.25
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Seibersdorf. Inst. fuer Metallurgie.
STRUCTURAL CHANGES IN PYROCARBON COATINGS OF SPHERICAL PARTICLES BY HEAT TREATMENT AND NEUTRON IRRADIATION.
P. Koss, K. Koizlik, H. Nickel, and E. Balthesen. Feb 74, 10p CONF-730601-7
U.S. Sales Only.

Descriptors: (*Pyrolytic carbon, *Microstructure), Anisotropy, Burnup, Deposition, Fluidized bed, Heat treatments, Neutrons, Physical radiation effects, Very high temperature.

For abstract, see NSA 30 08, number 21839.

SLA-74-186 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
DETECTION OF CERAMIC SURFACE DEFECTS BY REFLECTED LASER LIGHT.
D. Kramer, and G. J. Hof. Jun 74, 34p
Contract AT(29-1)-789

Descriptors: (*Ceramics, *Testing), (*Microelectronic circuits, *Inspection), (*Tantalum nitrides, *Defects), Electronic equipment, Films, Laser radiation, Reflection, Resistors, Sputtering, Substrates.

For abstract, see NSA 30 08, number 23427.

Y-1933 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
EFFECT OF CROSSLINKING ADDITIVES ON THE PROPERTIES OF CARBONS DERIVED FROM SELECTED PRECURSORS.
O. J. Horne, B. Jr. Napier, and W. E. Smith. 15 May 74, 44p
Contract W-7405-eng-26

Descriptors: (*Carbon, *Synthesis), Acenaphthene, Additives, Cross-linking, Hydrocarbons, Precursor.

For abstract, see NSA 30 08, number 23436.

Y-1946 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
DETERMINATION OF LATTICE PARAMETERS BY A SEARCH-SCAN COMPUTER-ASSISTED DATA ANALYSIS METHOD.
W. E. Baucum, D. A. Carpenter, L. E. Jr. Bearden, and K. A. Sells. Jul 74, 18p
Contract W-7405-eng-26

Descriptors: (*Titanium carbides, *Lattice parameters), (*Niobium carbides, Lattice parameters), Computers, Data processing, Structural chemical analysis, X-ray diffraction.

For abstract, see NSA 30 08, number 21526.

11C. Coating, Colorants, and Finishes

AD-785 707/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
STRUCTURE AND CHARACTERISTICS OF STEEL CHROMIUM PLATED IN A VACUUM,
N. S. Gorbunov, E. P. Ponomarenko, and V. P. Khokhlov. 29 Mar 74, 15p Rept no. FSTC-HT-23-1279-73
Trans. from Nauchn. Dokl. na Sovesbchanii po Probl. 'Struktura i Svoistva Zharoprochn. Metallich Marerialov', Moscow, 1970 p79-89.

Descriptors: *Carbon steels, *Chromizing, Vacuum, Translations, USSR.

Steels of the type 10KP, 20, 30, and 35L were chromium plated from the sublimated phase in a vacuum in a period of one to 15 hours. The 70% industrial ferrochrome Cr.00 was used in the spray. Through vacuum diffusion chromium plating, a diffused layer to a depth of 2 mm can be obtained on carbon steel for much higher operational characteristics than with 1KH13 steel, thus permitting carbon steel to be used instead of KH17N2 and KH18N9T steels.

AD-786 271/7GA PC$11.50/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
MATERIALS FOR PAINT AND VARNISH COATINGS,
M. M. Goldberg. Mar 74, 468p Rept no. FSTC-HT-23-0266-74
Trans. of mono. Materialy dlya Lakrasochnykh Pokrtry, Moscow, 1972 344p.

Descriptors: *Paints, *Varnishes, Materials, Coatings, Translations, USSR.
Identifiers: Alkyd resins, Formaldehyde resins, Polyurethane resins.

Paint and varnish materials and powder compositions on a base of synthetic film-forming substances are considered in this monograph. The properties of these materials and the field of use of the coatings obtained from them are presented.

BDX-613-1173 PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.
CHARACTERIZATION OF A CHROME--GOLD THIN FILM DEPOSITION PROCESS BY AUGER ANALYSIS.
F. A. Clay. Aug 74, 18p
Contract AT(29-1)-613

Descriptors: (*Chromium alloys, *Deposition), (*Gold alloys, Deposition), (*Tantalum nitrides, *Surface coating), Adhesion, Aluminium oxides, Auger effect, Bonding, Chemical coating, Chromium oxides, Compression, Electric conductivity, Electron spectroscopy, Etching, Films, Processing, Production, Substrates, Thickness.

For abstract, see NSA 30 08, number 21510.

BDX-613-1177(Rev.) PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.
PLATING ON POLYIMIDE.
C. J. Stimetz. Aug 74, 12p
Contract AT(29-1)-613

Descriptors: (*Imides, *Surface coating), (*Nickel, *Deposition), (*Copper, Deposition), Adhesion, Coatings, Electroplating, Etching, Plating, Thickness.

For abstract, see NSA 30 08, number 23403.

GEPP-126 PC$4.00/MF$2.25
General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
SYSTEM FOR DEPOSITION AND HYDRIDING OF THIN METALLIC FILMS WITHOUT AIR EXPOSURE.
C. C. Eichman, J. L. Comeau, and K. R. Rinehuls. 17p
Contract AT(29-2)-656

Descriptors: (*Erbium, *Hydridation), (*Erbium hydrides, *Deposition), Baking, Chemical analysis, Controlled atmospheres, Electron beams, Films, Gases, Thickness.

For abstract, see NSA 30 08, number 21517.

N74-30006/2GA PC$8.25/MF$2.25
General Electric Co., Philadelphia, Pa. Re-entry and Environmental Systems Div.
IMPROVED COATING FOR SILICA FIBER BASED CERAMIC REUSABLE SURFACE INSULATION (CRSI).
Contractor Report, 1 Jul. - 31 Dec. 1973.
T. J. Ormiston. Apr 74, 102p NASA-CR-134653
Contract NAS3-17793

Descriptors: *Ceramics, *Glass fibers, *Silicon dioxide, *Thermal control coatings, Aerodynamic heating, Protective coatings, Reentry, Space shuttles.

For abstract, see STAR 1219

PAT-APPL-482 104 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CERAMIC COATING FOR SILICA INSULATION.
Patent Application.
A. Pechman, and R. M. Beasley. Filed 24 Jun 74, 17p NASA-CASE-MSC-14270-1
Contract NAS9-12137
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Ceramic coatings, *Insulation, *Silicon dioxide, Emissivity, Glazes, Laminates, Moisture, *Patent applications, Silica glass, Spalling, Thermal shock.

Low density, fibrous, rigid, silica insulations are rendered impervious to moisture by application of a ceramic glaze coating comprising a silica barrier layer, and an emissivity glaze layer comprising a high silica glass component, an emissivity agent, and a borosilicate glass component. The resulting ceramic glaze laminate adhered to the fibrous silica insulation provides a moisture-impervious insulating material which exhibits a high emissivity and is resistant to delamination and spalling at repeated cycles of thermal shock.

PAT-APPL-482 105 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CERAMIC COATING FOR SILICA INSULATION.
Patent Application.
A. Pechman, and R. M. Beasley. Filed 24 Jun 74, 16p NASA-CASE-MSC-14270-2
Contract NAS9-12137
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Ceramic coatings, *Insulation, *Reentry vehicles, *Silicon dioxide, Atmospheric entry, *Patent applications, Spacecraft structures.

Lightweight, reusable, surface-insulating material for spacecraft has been developed. Since the low density, fibrous, refractory, silica insulations are quite porous and readily absorb moisture, it is necessary to coat the surfaces of such insulations with a coating which renders them impervious to moisture. A two-layered ceramic glaze coating for such silica insulations is described.

PATENT-3 783 014 Not available NTIS
Atomic Energy Commission, Washington, D.C.
ELECTROLESS COATING OF MOLYBDENUM ON STAINLESS STEELS.
Patent,
John W. Koger, and Eugene J. Lawrence. Filed 18 Jan 72, patented 1 Jan 74, 2p PAT-APPL-218 817
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Molybdenum, *Coating processes, *Stainless steels, *Patents, Fused salts, Fluorides, Molybdenum halides.
Identifiers: PAT-CL-117-130-R, Molybdenum fluorides.

The patent concerns an adherent coating of molybdenum on stainless steel which is obtained by contacting the stainless steel with a molten fluoride salt containing from 1 to 5 weight percent MoF6.

PATENT-3 785 994 Not available NTIS
Atomic Energy Commission, Washington, D.C.
GAS MIXTURE FOR FORMING PROTECTIVE COATINGS ON GRAPHITE.
Patent,
Melvin G. Bowman, and Dwayne T. Vier. Filed 23 Sep 60, patented 15 Jan 74, 4p PAT-APPL-58 139
Government owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Graphite, *Protective coatings, Patents, Carbides, Titanium carbide, Zirconium carbides, Niobium carbides, Hydrogen, Chlorides.
Identifiers: PAT-CL-252-372.

The patent relates to a gaseous mixture of hydrogen, hydrogen chloride, and a chloride of titanium, zirconium or niobium, which provides protection for graphite surfaces from hydrogen corrosion at temperatures greater than 1500C. The composition of the mixture is such that the metal chloride and hydrogen react with graphite to form a protective metal carbide layer.

11D. Composite Materials

AD-785 671/9GA PC$3.25/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
SHOCK HARDNESS OF GRAPHITE/EPOXY COMPOSITES,
David K. Roylance. 1973, 16p

Descriptors: *Fiber reinforced composites, *Carbon fibers, *Shock(Mechanics), Laminates, Epoxy resins, Antimissile defense systems, Tensile strength, Dynamic tests, Fracture(Mechanics).
Identifiers: Carbon fiber reinforced plastics, Graphite reinforced composites.

The principal requirements for ABM (Advanced Ballistic Missile) substructure marerials are outstanding strength and stiffness at low weight. Carbon/epoxy composites are particularly attractive in this regard. In fact, these composites are presently undergoing intensive assessment studies in anticipation of their being employed as substructure material for the Advanced Terminal Interceptor (ATI) system. This paper presents the results of an important phase of this assessment: the resistance, or 'hardness', of graphite/epoxy composites against damage due to intense shock waves. A shock hardness study of composites consists of two distinct phases: the measurement of the material's ability to mitigate a compressive wave before tensile components arise, and the material's ability to withstand dynamic fracture once the tensile components do arise.

AD-785 778/2GA Reprint
Princeton Univ N J
STRESS CONCENTRATION IN FILAMENTARY COMPOSITES WITH BROKEN FIBERS,
A. C. Eringen, and B. S. Kim. 1974, 24p AROD-8090.11-E

Contract DAHC04-69-C-0062
Sponsored in part by Office of Naval Research, Arlington, Va.
Availability: Pub. in Letters in Applied and Engineering Sciences, v2 p69-89 1974.

Descriptors: *Fiber reinforced composites, *Stresses, Crack propagation, Geometric forms, Differential equations, Numerical analysis.

By means of a dual integral equation technique, the stress distribution is determined in a filamentary composite with some broken fibers in various geometrical configurations. The formulation is made by assuming that fibers carry the tensile load and the matrix the transverse normal load and the shear. The ensuing difference-differential equations are solved for various cases of broken fibers (modelling one or two colinear cracks) when the composite is subjected to a uniform tensile load along the fibers at infinity. The stress concentration is found to be finite and increases without bound with the number of broken fibers. (Modified author abstract)

AD-786 143/8GA PC$5.25/MF$2.25
Naval Academy Annapolis Md
IMPACT STRENGTH OF FIBROUS COMPOSITE MATERIALS FOR HIGH PERFORMANCE STRUCTURES.
Final rept. 15 Jun 73-31 Aug 74,
George C. Chang. 31 Aug 74, 125p Rept no. EW-7-74

Descriptors: *Fiber reinforced composites, Impact strength, Structures, Fracture(Mechanics), Impact tests, Fiberglass, Composite materials, Metals, Matrix materials, Toughness, Graphite, Epoxy resins.
Identifiers: Carbon fiber reinforced plastics, Fiberglass reinforced plastics, Epoxy matrix composites, Graphite reinforced composites, Metal matrix composites.

Fundamental concepts of, and practices in, impact testing for the evaluation of toughness of engineering materials are discussed, along with the linear elastic fracture mechanics approach. Various impact testing methods, such as Izod, Charpy, DWTT, etc., are analyzed and compared. Also discussed are various aspects of testing for impact by foreign objects. Some relevant properties of advanced fiber-reinforced composite materials, such as glass/epoxy, graphite/epoxy, certain metal-matrix composites, etc., are discussed within the context of material toughness. The state-of-the-art in impact testing of such composites is analyzed, with significant results also summarized. Results of a series of impact testing carried out in this investigation are discussed. (Modified author abstract)

AD-786 192/5GA PC$3.25/MF$2.25
Texas Univ Austin Dept of Mechanical Engineering
SIZE AND VOLUME FRACTION EFFECTS ON FRACTURE BEHAVIOR IN COMPOSITE MATERIALS.
Final rept. 15 Mar 71-31 May 74,
Thomas H. Courtney. Aug 74, 16p* AROD-9408.3-MC
Grant DA-ARO-D-31-124-73-G136

Descriptors: *Composite materials, Matrix materials, Metals, Fracture(Mechanics), Fiber reinforced composites, Aluminum, Aluminum compounds, Nitrides, Fibers.
Identifiers: *Metal matrix composites, Eutectic composites.

The results of studies on the fracture behavior of metal matrix composite materials are summarized. These studies were conducted on both eutectic and 'bundle-and-draw' metal matrix composites. In the latter type of composite, two types of fracture mode were observed: in 'instantaneous' fracture, composite failure is concurrent with the failure of the first fiber; in 'stepwise' fracture, additional composite elongation after the first fiber break was necessary to induce composite fracture. The eutectic composite (Al-Al3Ni) studied failed generally by a statistical accumulation of fiber fractures. Analysis of fiber fracture prior to composite failure allowed a more accurate partitioning of stress between fiber and matrix as well as determination of insitu fiber ineffective lengths and distributive in breaking strengths. (Modified author abstract)

COM-74-50902/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
COMPOSITE RESTORATIVE MATERIALS IN DENTAL PRACTICE: A REVIEW.
Final rept.,
G. C. Paffenbarger, and N. W. Rupp. Mar 74, 11p
Sponsored in part by National Inst. of Dental Research, Bethesda, Md., Army Medical Research and Development Command, Washington, D.C., Veterans Administration, Washington, D.C., and the American Dental Association, Chicago, Ill.
Pub. in International Dental Jnl., v24 n1 p1-11 Mar 74.

Descriptors: *Composite materials, *Dental materials, Reviews, Bibliographies.

This review of the literature concerning composite resins discusses the composition, physical properties, uses and the manipulation techniques for some current, 1973, commercial products. These restorative materials are based upon the BIS-GMA resin reinforced with inorganic silicious fillers bonded to the resin matrix with a silane coupling agent. Their use is limited to the restoration of non-load bearing surfaces of the teeth.

N74-29784/7GA PC$5.50/MF$2.25
Commonwealth Scientific Corp., Alexandria, Va.
DEVELOPMENT OF A METHOD FOR FABRICATING METALLIC MATRIX COMPOSITE SHAPES BY A CONTINUOUS MECHANICAL PROCESS.
Quarterly Progress Report, 15 Oct. 1973 - 15 Mar. 1974.
A. P. Divecha. 15 Mar 74, 46p NASA-CR-120248, QPR-11
Contract NAS8-27010

Descriptors: *Aerospace engineering, *Metal matrix composites, *Structural design, Aluminum compounds, Cost estimates, Graphite.

For abstract, see STAR 1219

N74-29982/7GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SOME METAL-GRAPHITE AND METAL-CERAMIC COMPOSITES FOR USE AS HIGH ENERGY BRAKE LINING MATERIALS.
R. C. Bill. Aug 74, 22p NASA-TN-D-7756, E-7845

Descriptors: *Aircraft brakes, *Composite materials, *Heat resistant alloys, *Materials tests, *Performance tests, *Wheel brakes, Ceramics, Cermets, Copper alloys, Graphite, Lanthanum fluorides, Lanthanum oxides.

For abstract, see STAR 1219

N74-30002/1GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
BORON/ALUMINUM-GRAPHITE/RESIN ADVANCED FIBER COMPOSITE HYBRIDS.
C. C. Chamis, R. F. Lark, and T. L. Sullivan. 1974, 17p NASA-TM-X-71580, E-8030
Conf-Proposed for Presentation at the Sixth Natl. Tech. Conf., Dayton, Ohio, 8-10 Oct. 1974; Sponsored by the Society of Aerospace Material and Process Engineers.

Descriptors: *Aluminum, *Boron, *Composite materials, *Fibers, *Graphite, Adhesive bonding, Feasibility analysis, Impact resistance, Laminates, Stresses.

For abstract, see STAR 1219

N74-31025/1GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
COMPRESSIVE STRENGTH OF FIBER REINFORCED COMPOSITE MATERIALS.
J. G. Davis, Jr.. Aug 74, 22p NASA-TM-X-71992
Conf-Presented at Astm: Composite Reliability Conf., Las Vegas, Nev., 15-16 Apr. 1974.

Descriptors: *Composite materials, *Compressive strength, *Reinforcing fibers, Boron compounds, Epoxy compounds, Shear stress.

For abstract, see STAR 1220

PATENT-3 814 645 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
METHOD OF REPAIRING DISCONTINUITY IN FIBERGLASS STRUCTURES.
Patent.
L. L. Gelb, W. B. Helbert, Jr., R. B. Enie, and R. F. Mulliken. Patented 4 Jun 74, 4p PAT-APPL-251 752
Misc-Filed 9 May 1972. Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Epoxy resins, *Glass fibers, *Maintenance, *Patents, Rocket engine cases.
Identifiers: PAT-CL-156-94.

Damaged fiberglass structures are repaired by substantially filling the irregular surfaced damaged area with a liquid, self-curing resin, preferably an epoxy resin mixed with choped fiberglass, and then applying to the resin surface the first of several woven fiberglass swatches which has stitching in a zig-zag pattern parallel to each of its edges and a fringe of warp and fill glass fibers about the edges outward of the stitching. The method is especially applicable to repair of fiberglass rocket engine casings and is particularly advantageous since it restores the repaired fiberglass structure to substantially its original strength without any significant changes in the geometry or mass of the structure.

11E. Fibers and Textiles

AD-786 029/9GA PC$3.75/MF$2.25
Minnesota Univ Minneapolis Dept of Aeronautics and Engineering Mechanics
FUNCTIONING OF THE OMEGA SENSOR ON TEXTILE SAMPLES UNDER HIGH LOADING RATES.
Final rept. Jul 73-May 74,
H. G. Heinrich, and R. A. Noreen. Sep 74, 33p AFFDL-TR-74-78
Contract F33615-73-C-3149

Descriptors: *Textiles, *Stresses, *Parachute canopies, Detectors, Loads(Forces), Nylon, Strain rate.

The Omega sensor was developed for measuring stress in textile and other flexible materials. As a first application, it was intended to measure stresses in the material of parachute canopies. In an earlier study, it was found that circumferential stresses of inflated parachute canopies indicated by Omega sensors agreed with theoretically predicted stresses. The question then arose whether or not sensor indicated stresses are realistic under a high rate of loading, since it is known that the strain of nylon and other textile materials varies with the rate of loading. This study investigates this question and no dynamic effects upon the

Omega sensor or the indicated stresses were found. (Modified author abstract)

11F. Metallurgy and Metallography

AD-785 591/9GA PC$4.75/MF$2.25
Materials Research Lab Inc Glenwood Ill
FLOW AND FRACTURE PROPERTIES OF ALUMINUM ALLOYS POTENTIALLY USEFUL FOR SMALL ARMS CARTRIDGE CASES.
Final rept.,
E. J. Ripling, and Eliezer Falkenstein. Mar 73, 98p
Contract DAAA25-70-C-0715

Descriptors: *Aluminum alloys, *Fracture(Mechanics), *Dynamic tests, Tensile properties, Fatigue(Mechanics), Stress strain relations, Cartridge cases, Toughness.

The most useful laboratory measure for evaluating fracture resistance is the fracture toughness which must also be measured at the rates and temperatures that simulate service. Since cartridge case materials are very thin, fracturing occurs under a condition of plane stress rather than plane strain. Measurements of dynamic yield strength have been made by numerous investigators. Dynamic measurements of plane stress fracture toughness, on the other hand, have not been made prior to this program. Consequently, it was necessary to develop a method for measuring this property on thin sheets in a fashion such that dynamic loading would be possible. Tensile and fracture toughness tests of each material were made at rise times (time required to increase the load from zero to its critical value). The critical value of load was the 0.2 percent offset yield stress for tensile testing, and the plateau (or equilibrium) value of the critical stress intensity factor for toughness testing. All of the alloys were tested in the longitudinal and the long transverse direction, and early in the program tests were also made for each rate and direction at test temperatures of -70, +70 and +165F.

AD-785 617/2GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
A METHOD OF CONTROLLING SHOCK INDUCED DAMAGE IN ALUMINUM ALLOYS,
Andrew M. Dietrich, Jr., Victor A. Greenhut, and Stanley K. Golaski. 1973, 15p

Descriptors: *Aluminum alloys, *Shock(Mechanics), Spallation, Fracture(Mechanics), Copper alloys, Aging(Materials), Loads(Forces).
Identifiers: Vacancies(Crystal defects), Aluminum alloy 4-1/2 Cu.

In the design of armor to protect a vehicle, suppression of behind the armor fragments (spall resistance) can have significant influence on mission survivability. It is shown that, once a microscopic mechanism is postualted for the occurence of spall fracture, it is possible to tailor the response of a material to suppress the spall fracture process. Al-4 1/2 wt.% Cu was selected as the material for testing. By selection of suitable heat treatments prior to shock-loading a variety of homogeneous precipitate distributions with differing potential as vacancy getters may be obtained. The alloy, fabricated as Instron tensile specimens and shock loading specimens, was heat treated to three conditions designated under-, critical- and over-aged. The experiments to-date indicate that: (a) Vacancies are significant to the nucleation of porosity damage during shock loading as evidence by strong precipitate growth in the under-aged alloys. (b) At the shock strengths examined the potential for vacancy gettering action is more important to suppressing damage than are yield strength, ultimate strength, work handening rate or ductility as shown by comparison of the results of the under-, over-, and critical-aged alloys.

AD-785 690/9GA PC$3.25/MF$2.25
Watervliet Arsenal N Y Benet Weapons Lab
FATIGUE BEHAVIOR OF METAL LAMINATES,
Joseph F. Throop, and James J. Miller. 1973, 16p

Descriptors: *Fatigue(Mechanics), *Laminates, *Steel, *Aluminum alloys, Fracture(Mechanics), Crack propagation, Bonding, Adhesives, Brazing.
Identifiers: Steel 1018, Aluminum alloy 6061.

The main purpose of this investigation was to study the effects of the interfaces in metallic laminates upon fatigue crack propagation and fracture resistance in order to exploit any crack retardation effects and to enable the prevention of crack acceleration effects. This is the report of exploratory experimental studies of the behavior of AISI 1018 steel laminates and 6061-T6 structural aluminum alloy laminates using 1-inch thick ASTM compact specimens (1) for fatigue crack growth and fracture tests. This study is concerned with the fatigue damage tolerance and fracture resistance in bonded metal laminates.

AD-785 695/8GA PC$3.25/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
HIGH DAMPING MATERIALS, FUNDAMENTAL ASPECTS,
Richard J. Weiss, and Kenneth . Tauer. 1974, 8p

Descriptors: *Vibration, *Damping, Numerical analysis, Alloys, Steel, Nickel alloys, Titanium alloys, Thermodynamics.

Any theoretical treatment of anharmonicity and 'soft modes' in real crystals is prodigious so it is useful to examine a very simple system just to see how anharmonicity couples normal modes together and affects certain physical properties. The system chosen is that of the one-dimensional coupled oscillators each of identical mass M coupled between two rigid (or non-rigid) walls by three identical springs. Mathematical expressions are provided and the thermodynamic relationships are expressed in this report. Steel and Nitinol are used for examples.

AD-785 725/3GA PC$5.25/MF$2.25
Grumman Aerospace Corp Bethpage N Y Research Dept
THE ROLE OF MICROSTRUCTURE IN DETERMINING FRACTURE TOUGHNESS AND FATIGUE PROPERTIES OF HIGH STRENGTH TITANIUM ALLOYS,
Albert Tobin. Aug 74, 108p Rept no. RE-485

Descriptors: *Fracture(Mechanics), *Fatigue(Mechanics), *Titanium alloys, High strength alloys, Microstructure, Crack propagation, Aircraft, Predictions, Aluminum alloys, Vanadium alloys, Tin alloys, Test methods, Reviews.
Identifiers: *Fracture(Mechanics), Titanium alloy 6Al 4V, Titanium alloy 6Al 2Sn 6V.

High strength titanium alloys have found extensive application in critical aircraft components because of their high strength/density and generally good engineering properties. The ability to predict the response of the material to the growth of subcritical cracks is important because of the risk of catastrophic failures in aircraft. This review examines the general theory of fatigue and flaw growth and relates these to fracture mechanics parameters. A general review of the physical metallurgy of titanium alloys is presented with primary emphasis placed on Ti-6Al-4V and Ti-6Al-6V-2Sn. Emphasis is placed on the roles of microstructural, chemical, and textural variations in controlling the fracture toughness and fatigue crack growth rate. (Modified author abstract)

AD-785 756/8GA Reprint
Pittsburgh Univ Pa Dept of Chemistry
MAGNETIC ANISOTROPY IN THE TH(CO1-XFEX)5 AND Y(CO1-XFEX)5 SYSTEMS,
F. Rothwarf, H. A. Leupold, J. Greedan, W. E. Wallace, and Dilip K. Das. 28 Jun 73, 7p AROD-5375.20-M
Grant DA-ARO-D-31-124-71-G74
Prepared in cooperation with Raytheon Co., Waltham, Mass. Microwave and Power Tube Div.
Revision of report dated 10 Apr 73.
Availability: Pub. in International Jnl. of Magnetism, v4 p267-271 1973.

Descriptors: *Cobalt alloys, *Iron alloys, *Thorium alloys, *Yttrium alloys, Magnetic properties, Anisotropy, Intermetallic compounds, Permanent magnets, Energy levels.
Identifiers: Cobalt intermetallics, Iron intermetallics, Thorium intermetallics, Yttrium intermetallics, Magnetic anisotropy.

Magnetization measurements were made at room temperature on ThCo5 and YCo5 and on the ternaries TH(Co sub 1-xFe(sub x))5 and Y(Co sub 1-xF(sub x)5 in the form of aligned powders with the field directed along the easy and hard magnetic direction. The field was varied from - 100 to + 100 kOe. The anisotropy fields (HA) are found to be 160 and 120 kOe for ThCo5 and YCo5, respectively. Replacement of one Co by Fe in the RCo5 materials leaves H sub A unaffected. Further introduction of Fe results in a sharp decrease in H sub A. These results seem to indicate that Co in the 2c sites, which lie in the plane containing the R atoms, is crucial for the large magnetic anisotropy of the RCo5 compounds. (Modified author abstract)

AD-785 767/5GA Reprint
Cornell Univ Ithaca N Y School of Applied and Engineering Physics
ELASTIC LEED INTENSITY-ENERGY STUDIES OF CLEAN (001), (110) AND (111) NICKEL SURFACES,
J. E. Demuth, and T. N. Rhodin. 27 Sep 73, 40p
AROD-8961.12-MC
Grant DA-ARO-D-31-124-71-G56
Revision of report dated 25 Jul 73.
Availability: Pub. in Surface Science, v42 p261-298 1974.

Descriptors: *Nickel, *Surface properties, Electron diffraction, Auger electron spectroscopy.
Identifiers: Low energy electron diffraction.

Elastic low energy electron diffraction (LEED) intensity-energy (I-E) measurements for clean (001), (110), and (111) nickel surfaces were obtained at room temperature. Surface composition was monitored by Auger spectroscopy. I-E data from 15 to 220 eV were obtained at normal incidence for the non specular beams and for the specular beams at incidence angles from 4 degrees to 20 degree on the 0 and 45 degree azimuths of (001), on the 0 and 90 degree azimuths of (110), and on the 0 azimuth of (111) nickel. Normalization of the data was performed electronically during data acquisition. (Modified author abstract)

AD-785 782/4GA Reprint
Florida Univ Gainesville Dept of Materials Science and Engineering
CONCERNING THE EVALUATION OF D(P)/D(E) AT SUBAMBIENT TEMPERATURES,
R. E. Reed-Hill, and W. R. Cribb. 21 Jan 74, 7p
AROD-9826.10-MC
Grant DA-ARO-D-31-124-72-G70

Descriptors: *Dislocations, *Strain(Mechanics), Nickel, Low temperature.

Two recent papers have presented conflicting evidence concerning the manner in which the dislocation density changes with strain in fcc at low temperatures. This letter is primarily concerned with the evaluation of the relationship. Also an expression for the work hardening rate is derived. The equation is tested utilizing slip line length measurements and stress-strain data of Ni 270. (Modified author abstract)

AD-785 812/9GA Reprint
State Univ of New York Stony Brook Dept of Materials Science
PHASE DECOMPOSITION IN ALUMINUM ALLOYS QUENCHED FROM THE LIQUID STATE,
S. C. Agarwal, and H. Herman. 28 Jun 73, 19p
AROD-8571.6-MC
Grant DA-ARO-D-31-127-73-G169
Availability: Pub. in Proceedings for the Conference on Phase Transitions and Their Applications in Materials Science, University Park, Pennsylvania, May 23-25, 1973, p207-222 1973.

Descriptors: *Phase transformations, *Aluminum alloys, Liquid phases, Quenching, Precipitation, Reviews.
Identifiers: Spinodal decomposition.

Liquid quenching of precipitation alloys can achieve greatly enhanced solute supersaturation in the presence of minimal solute clustering. Furthermore, this condition persists at ambient temperature and can be used as an excellent starting point for studies of precipitation kinetics, such as spinodal decomposition. A review of some recent studies in phase decomposition in liquid-quenched Al-base alloys. (Author)

AD-785 820/2GA Reprint
Columbia Univ New York Dept of Mechanical Engineering
PLASTIC DEFORMATION AND LUDERS BAND PROPAGATION IN ALPHA-BRASS,
N. Balasubramanian, J. C. M. Li, and M. Gensamer. 5 Apr 73, 11p AROD-5642.7-MC
Contract DA-31-124-ARO(D)-382
Availability: Pub. in Materials Science and Engineering, v14 p37-45 1974.

Descriptors: *Brass, *Plastic deformation, Stress relaxation, Strain rate, Dislocations.
Identifiers: Luder bands.

Three methods are used to study the dislocation dynamics in alpha-brass. These are stress relaxation, double strain rate cycling and Luders band propagation. All three methods yield similar values, 4 plus or minus 1, for the dislocation velocity--stress exponent. In the four alloys studied, the internal stress accounts for 90-95% of the applied stress. The effective stress does not vary appreciably with strain suggesting that work hardening is mainly due to the increase of internal stress. For a given grain size and strain, the internal stress increases rapidly near 15% Zn, consistent with a change of dislocation arrangement at that composition. (Author)

AD-785 840/0GA Reprint
Lehigh Univ Bethlehem Pa Dept of Metallurgy and Materials Science
THE EFFECT OF AUSTENITE GRAIN SIZE ON MICROCRACKING IN MARTENSITE OF AN FE-1.22C ALLOY,
R. P. Brobst, and G. Krauss. 31 Jul 73, 8p AROD-11665.1-MC
Grant DAHC04-74-G-0021
Prepared in cooperation with Knolls Atomic Power Lab., Schenectady, N.Y.
Availability: Pub. in Metallurgical Transactions, v5 p457-462 Feb 74.

Descriptors: *Carbon steels, *Fracture(Mechanics), *Austenite, *Grain size, Crack propagation, Martensite, Iron alloys.

Austenitic grain sizes of ASTM No. 9 and coarser were produced in an Fe-1.22 pct C alloy austenitized by immersion in molten lead at 1640F (893C), a temperature just above the Acm for this alloy, for periods between 20 s and 1 h. Microcracking sensitivity, Sv, measured as crack area/unit volume martensite, was determined as a function of grain size in brine quenched specimens. Two locations of microcracks were observed in this investigation: 1) intragranular, resulting from the impingement of one martensite plate with another, and 2) grain boundary or intergranular resulting from the impingement of martensite plates at prior austenite grain boundaries. (Modified author abstract)

AD-785 890/5GA PC$3.75/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
QUALITY OF KILLED STEEL INGOTS,
M. I. Kolosov, A. I. Stroganov, Yu. D. Smirnov, and B. P. Okhrimovich. May 74, 34p Rept no. FSTC-HT-23-0150-74
Trans. of unidentified Russian language mono., pub. by Metallurgiya, Moscow, 1973 p364-388.

Descriptors: *Steel, *Refining(Metallurgy), Translations, USSR.
Identifiers: Electroslag refining, Vacuum melting.

This chapter of a larger work discusses the need for developing steels which meet the increased requirements of new branches of science. Production methods discussed are electroslag and vacuum-arc remelting. The advantages and disadvantages of the two are compared with each other and with ordinary methods of steel refining. The two methods of remelting produce steels of high quality with complementing uses. The authors concluded that these methods are economically efficient and that the volume of steel produced by these methods should be increased.

AD-785 898/8GA PC$25.2/MF$2.25
National Bureau of Standards Washington D C
PROCEEDINGS OF THE INTERNATIONAL CONGRESS ON MARINE CORROSION AND FOULING (3RD). HELD AT GAITHERSBURG, MARYLAND, ON OCTOBER 2-6, 1972.
1974, 1047p*
Contract N00014-72-C-0281

Descriptors: *Corrosion, *Fouling, *Meetings, Marine biology, Fouling organisms, Sea water, Ships, Cathodic protection, Coatings, Steel.

The fields of corrosion and marine biology are known to overlap significantly in that the only metals resistant to colonization by marine organisms in quiescent sea water are those which corrode and produce toxic corrosion products. Measures taken to prevent the corrosion (such as cathodic protection) cause these metals to foul, and a common antifouling measure -- the electrolytic production of hypochlorous acid -- may alter substantially the corrosive character of sea water. As is reported in several papers of the Third Congress, marine algae may penetrate and cause deterioration of marine coatings and anaerobic bacteria may alter the corrosion behavior of steel in a marine environment. These are examples of the complex interplay between biological factors, corrosion, and the measures used to control both fouling and corrosion. These kinds of interactions document the need for a Congress which included coverage from the sometimes disparate disciplines of biology, chemistry, physics, and engineering.

AD-785 907/7GA PC$3.25/MF$2.25
Rensselaer Polytechnic Inst Troy N Y Materials Div
MICROSTRUCTURAL CHARACTERIZATION AND STRESS CORROSION CRACKING SUSCEPTIBILITY OF AL-ZN-MG-TI ALLOYS.
Technical rept.,
C. Chen, and Gary Judd. Sep 74, 19p Rept no. TR-6
Contract N00014-67-A-0117-0009

Descriptors: *Aluminum alloys, *Stress corrosion, *Aging(Materials), Crack propagation, Magnesium alloys, Zinc alloys, Titanium, Additives, Grain boundaries, Sodium chloride, Microstructure, Electron microscopy.

The effects of adding small amounts of titanium to age-hardening Al-Zn-Mg alloys have been studied by transmission electron microscopy, mechanical atests, and stress corrosion cracking (SCC) tests. The zinc, magnesium, and titanium content of the alloys was varied and the effect of aging upon these alloys was examined. Multiple stages of aging were observed for several of the titanium addition alloys. The resistance to SCC of the Al-Zn-Mg ternary in an aqueous solution (3.5%NaCl) at room temperature was significantly improved in the titanium addition alloy with 0.12% as compared to an alloy with 0.23% Ti reported upon previously. The addition of 0.09%Ti to Al-7%Zn-2%Mg alloy produces a finer grain boundary precipitation and no deleterious effect on the SCC property. (Author)

AD-785 915/0GA PC$3.25/MF$2.25
Northeastern Univ Boston Mass Solid State Chemistry Lab
DEVELOPMENT AND TESTING OF CONTINUOUS-QUENCHING AND CONSOLIDATION TECHNIQUES FOR THE BULK PRODUCTION OF METASTABLE ALLOYS.
Final rept.,
B. C. Giessen. 6 Sep 74, 9p Rept no. N14-68-A-207-6-2
Contract N00014-68-A-0207-0006

Descriptors: *Quenching, Plasmas(Physics), Amorphous materials, Copper alloys, Zirconium alloys.
Identifiers: *Plasma spraying, *Amorphous alloys.

The design, construction and testing of a splat cooling unit based on a plasma gun are discussed, as well as studies on the production and processing of bulk quantities of amorphous Cu-Zr alloys prepared with this unit. (Author)

AD-785 979/6GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
CERTAIN PROPERTIES OF PRESSED ALUMINUM EUTECTIC ALLOYS,
N. R. Bochvar, M. E. Drits, and L. L. Rokhlin. May 74, 15p Rept no. FSTC-HT-23-0418-74
Trans. of Fizika i Khimiya Obrabotki Materialov (USSR) v5 p54-59 1972.

Descriptors: *Aluminum alloys, *Hot pressing, Eutectics, Mechanical properties, Acoustic properties, Copper alloys, Magnesium alloys, Zinc alloys, Fibers, Microstructure, Translations, USSR.

This work evaluates the possibility of obtaining fibrous structures in aluminum eutectic alloys by pressing. Certain mechanical and physical properties of the pressed alloys are determined. One can produce a fibrous structure in Al--Al3Mg2 alloy by hot pressing and annealing. The best strength properties for room temperature in a hot-pressed state were in such alloys as Al--Al3Mg2, Al--Al2Cu, Al--MgZn2 and Al--Al2CuMg. The coefficient of ultrasonic damping of eutectic aluminum alloys is low and gets worse as a result of annealing.

AD-786 070/3GA Reprint
Massachusetts Inst of Tech Cambridge
THERMODYNAMICS OF THE ALPHA-GAMMA TRANSFORMATION IN FE-CR ALLOYS,
John Chipman. 16 Aug 73, 5p AROD-11415.1-MC
Contract DAHC04-73-C-0027
Availability: Pub. in Metallurgical Transactions, v5 p521-524 Feb 74.

Descriptors: *Iron alloys, *Chromium alloys, *Phase transformations, Thermodynamics, Free energy.

Partial molar free energies of the components are utilized in an evaluation of the properties of the fcc phase in Fe-Cr alloys from the observed distribution of elements between alpha and gamma phases and the properties of the bcc phase. (Author)

AD-786 085/1GA Reprint
Michigan Technological Univ Houghton Dept of Metallurgical Engineering
ON THE DRIVING FORCE FOR THE GROWTH AND DISSOLUTION OF GRAIN BOUNDARY ALLOTRIOMORPHS BY THE 'COLLECTOR PLATE' MECHANISM,
H. I. Aaronson, and K. C. Russell. 21 Mar 74, 6p AROD-11264.3-MC
Grants DA-ARO-D-31-124-73-G144, NSF-GH-37103
Prepared in cooperation with Massachusetts Inst. of Tech., Cambridge. Dept. of Metallurgy and Materials Science.
Availability: Pub. in Scripta Metallurgica, v8 n5 p559-562 1974.

Descriptors: *Grain boundaries, *Aluminum alloys, *Crystallization, Diffusion, Precipitation, Copper alloys, Silver alloys.

Grain boundary allotriomorphs are precipitate crystals which nucleate at grain boundaries in the matrix phase and grow preferentially and more or less smoothly along them. Allotriomorphs both grow and dissolve largely or entirely by volume diffusion in substitutional alloys with an f.c.c. matrix. When growth of Theta allotriomorphs in Al-4% Cu and of beta allotriomorphs in Ag-5.6% Al takes place at lower temperatures, the 'collector plate' mechanism is found to play an increasingly important role in the growth process. This mechanism consists of volume diffusion to the grain boundaries (which serve as 'collector plates') diffusion along the grain boundaries to the growing allotriomorphs and then diffusion along the predominantly disordered broad faces of the allotriomorphs and deposition on these faces.

AD-786 091/9GA Reprint
Lehigh Univ Bethlehem Pa Dept of Metallurgy and Materials Science
PACKET MICROSTRUCTURE IN FE-0.2 PCT C MARTENSITE,
G. Krauss, C. A. Apple, and R. N. Caron. 6 Aug 73, 9p AROD-11665.2-MC
Grant DAHC04-74-G-0021
Prepared in cooperation with Bethlehem Steel Corp., Pa. Homer Research Lab. and Olin Metals Research Labs., New Haven, Conn.
Availability: Pub. in Metallurgical Transactions, v5 p593-599 Mar 74.

Descriptors: *Carbon steels, *Martensite, Microstructure, Electron microscopy, Iron alloys.

The arrangement, size, and boundary area of the laths that make up a packet of martensite in a coarse-grained Fe-0.2 pct C alloy were studied by replica and thin foil electron microscopy. Frequently laths of two habit plane variants coupled to a single (111)A plane of the parent austenite are observed in a packet. The total lath boundary area per unit volume of martensite obtained by analysis of micrographs taken from thin foils is quite high, 65,000 per cm, and analysis of packet structure by selected area diffraction and precision dark field techniques show that there may be five times as much low angle boundary areas as high angle boundary area in a packet. (Modified author abstract)

AD-786 177/6GA Reprint
North Carolina State Univ Raleigh Dept of Materials Engineering
THE EFFECTS OF CRYSTALLITE ORIENTATION AND SIZE ON THE STRENGTH OF POLYCRYSTALS,
J. B. McCombs, D. I. Golland, and G. Mayer. 19 Oct 73, 11p AROD-9730.4-MS
Grant DA-ARO-D-31-124-71-G31
Availability: Pub. in Materials Science and Engineering, v15 p275-282 1974.

Descriptors: *Iron, Polycrystalline, Orientation(Direction), Strength(Mechanics), Grain size.

The effect of crystallite orientation and crystallite size on polycrystalline strength has been investigated for Ferrovac E alpha-iron. Individual crystallite orientations, measured by etch pit techniques, have been used in determining weighted Taylor strength factors for different uniform grain sizes obtained by recrystallizing iron rods. Uniaxial tension tests and axisymmetric drawing tests were performed on specimens of each grain size. The present results on polycrystalline specimens have been used in conjunction with a previous analysis on single crystals of the same materials to determine the validity of the Taylor analysis, which predicts that strength is dependent on an orientation factor, M, and an orientation independent shear stress for slip, tau. It would appear that the Taylor analysis does not hold for polycrystalline specimens of various grain sizes. (Modified author abstract)

AD-786 213/9GA PC$3.75/MF$2.25
Florida Univ Gainesville
THE SIGNIFICANCE OF THE 'PROTECTION POTENTIAL' FOR FE-CR ALLOYS AT ROOM TEMPERATURE,
K. K. Starr, E. D. Verink, Jr., and M. Pourbaix. 1974, 28p
Contracts N00014-68-A-0173-0015, N00014-68-A-0173-0003

Descriptors: *Cathodic protection, *Corrosion inhibition, *Iron alloys, *Chromium alloys, Electrochemistry, Salt water, Anodic polarization, Voltage.
Identifiers: Iron alloy 12Cr.

The concept of the 'Protection Potential3 (against pit propagation) was introduced by M. Pourbaix et al. during the early 1960's as a result of research related to the pitting behavior of stainless steels and of copper in the presence of aqueous solutions containing chloride. It was suggested that, if the solution does not then contain any oxidizing species (such as oxygen, chromate, copper, etc.), this zero-current potential corresponds to a state of no-oxidation, and this means no corrosion. The purpose of the research reported herein was to apply the suggestion of Pourbaix in an attempt to distinguish between repassivation and deactivation mechanisms for an Fe-12Cr alloy in saline solutions.

AD-786 229/5GA PC$3.25/MF$2.25
California Univ Berkeley Dept of Materials Science and Engineering
COMPARATIVE FRACTURE TOUGHNESS TESTING OF CRYOGENIC ALLOYS AT LIQUID HELIUM TEMPERATURE.
Technical rept.,
Sungho Jin, S. K. Hwang, and J. W. Morris, Jr. Aug 74, 24p Rept no. TR-5
Contract N00014-69-A-0200-1062
Sponsored in part by Atomic Energy Commission, Washington, D.C.

Descriptors: *Fracture(Mechanics), *Iron alloys, *Cryogenics, Yield strength, Titanium alloys, Test methods, Grain size, Nickel alloys.
Identifiers: *Fracture toughness, Iron alloy 12 Ni 1/4-Ti.

Fracture behavior of the Fe-12Ni-0.25Ti alloy grain refined through thermal cycling was studied down to liquid helium temperature using a simple method of cryogenic fracture toughness testing. Comparison tests were also made with two other common cryogenic alloys. Ultrafine grained Fe-12Ni-0.25Ti alloy, which is 100% ferritic, behaved in a ductile manner similar to 304 austenitic steel. It was shown that the ductile-brittle transition temperature of the ferritic steel specimen can be suppressed below liquid helium temperature by grain refinement even in the presence of a sharp crack. Yield strength at liquid nitrogen temperature, and yield strength at liquid helium temperature were obtained. (Modified author abstract)

AD-786 245/1GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
OXIDATION OF NA2SO4 COATED NI-20CR-2THO2.
Journal article,
H. H. Davis, H. C. Graham, and G. F. Uhlig. Dec 72, 13p Rept no. ARL-74-0045
Availability: Pub. in Metallurgical Transactions, v3 p3247-3257 Dec 72.

Descriptors: *Oxidation, *Nickel alloys, *Chromium alloys, *Sulfates, Gas turbines, Corrosion, Thorium dioxide, Sodium compounds.
Identifiers: Nickel alloy 20Cr 2ThO2, Sodium sulfates.

When high temperature nickel- or cobalt-base superalloys are used as vanes and blades in gas turbine engines, they are found susceptible to an accelerated attack, much faster than normal oxidation. The resulting catastrophic deterioration has been related to the presence of salt deposits, particularly Na2SO4, on the hot section components. This corrosion phenomenon has been variously referred to as 'hot corrosion' or 'sulfidation'. The Na2SO4-induced oxidation of Ni-20Cr-2ThO2 has been studied at 900 and 1000C in 150 torr O2. A rapid weight-gain period, corresponding to NiO formation occurs after a short incubation period. The duration of the rapid weight gain stage persists for about 2 h and terminates with the development of a continuous Cr2O3 internal layer. Subsequent oxide formation is extremely slow, similar to that reported for normal oxidation of TD-NiCr. (Modified author abstract)

AD-786 246/9GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
STUDY OF GRAIN BOUNDARY FRACTURE SURFACES IN DOPED TUNGSTEN-RHENIUM ALLOYS.
Journal article,
Ronald Simpson, George Dooley, III, and T. W. Haas. 21 May 73, 9p Rept no. ARL-74-0048
Availability: Pub. in Metallurgical Transactions v5 p585-591 Mar 74.

Descriptors: *Tungsten alloys, *Rhenium alloys, *Fracture(Mechanics), Potassium, Auger electron spectroscopy, Electron microscopy, Grain boundaries.
Identifiers: Scanning electron microscopy.

The combination of Auger electron spectroscopy and scanning electron microscopy has identified the source of the unique interlocked elongated grains responsible for the high temperature sag resistance in doped tungsten and tungsten-rhenium alloys as due to bubbles which are formed by the volatilization of potassium during sintering. By pinning grain boundaries these bubbles raise the recrystallization temperature (from 1300C to 2100C) and their distribution within the material controls the recrystallized grain morphology. There is a thin layer of potassium remaining on the bubble surfaces. The size and distribution of the bubbles is related to the amount of material deformation during processing. Increasing rhenium content does not affect the concentration or distribution of residual potassium. It has no noticeable effect on bubble size, distribution or density. (Modified author abstract)

AD-786 247/7GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
QUANTITATIVE COMPARISON OF TI AND TIO SURFACES USING AUGER ELECTRON AND SOFT X-RAY APPEARANCE POTENTIAL SPECTROSCOPIES.
Journal article,
J. T. Grant, T. W. Haas, and J. E. Houston. 9 Oct 73, 6p Rept no. ARL-74-0094
Availability: Pub. in Jnl. of Vacuum Science and Technology, v11 n1 p227-230 Jan/Feb 74.

Descriptors: *Titanium, *Titanium oxides, *Auger electron spectroscopy, *X ray spectroscopy, Surface properties.

Integration techniques have been used to obtain the relative surface concentrations of Ti in Ti metal and TiO and between Ti and O in the oxide by Auger electron and soft x-ray appearance potential spectroscopies. It is shown that the use of peak-to-peak signal strengths in derivative data as a measure of relative concentration can give erroneous results due to differences in the line shapes of the various features. This sensitivity to the details of the spectral shapes is shown to be essentially eliminated in data corresponding to the integrals of the derivative spectra. (Modified author abstract)

AEC-tr-7408 PC$8.50/MF$2.25
RARE EARTH METALS AND ALLOYS.
E. M. Savitskii, and V. G. Terekhova. 1974, 106p
TT-73-58024
Translation of Redkozemel'ne metally i splavy, Izdatel'stvo Nauka, Moscow, 1971.

Descriptors: (*Rare earths, *Mechanical properties), (*Rare earth alloys, Mechanical properties), Phase diagrams, Physical properties, Rare earth compounds.

For abstract, see NSA 30 08, number 21647.

AERE-R-7734 PC$4.25/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
FORMATION OF CAVITIES IN STEELS EXPOSED TO LIQUID SODIUM.
A. M. Stoneham. May 74, 21p
U.S. Sales Only.

Descriptors: (*Steels, *Corrosion), (*Sodium, *Corrosive effects), Austenite, Cavities, Chemical reaction kinetics, Ferrite, Leaching, Mechanical properties, Reviews.

For abstract, see NSA 30 08, number 21589.

CEA-R-4565 PC$8.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
TRACER DIFFUSION STUDY IN BINARY ALLOYS.
J. L. Bocquet. Jul 74, 98p
In French. U.S. Sales Only.

Descriptors: (*Copper alloys, *Diffusion), (*Iron alloys, Diffusion), (*Silver alloys, Diffusion), (*Zinc alloys, Diffusion), Binary alloy systems, Correlations, Electrophoresis, Solid solutions, Spectra, Tracer techniques, Vacancies, Cadmium alloys.

For abstract, see NSA 30 08, number 21650.

CEA-R-4566 PC$6.50/MF$2.25
CEA Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
STUDY OF PHASE TRANSFORMATIONS IN TITANIUM ALLOYS. II. CONTRIBUTION TO THE STUDY OF ISOTHERMAL TRANSFORMATIONS IN TI--6% AL--6% V--2% SN--TITANIUM ALLOY, AFTER QUENCHING FROM (ALPHA + BETA).
C. Fontalirand, C. Beauvais, J. P. Fidelle, and B. Hocheid. May 74, 68p
In French. U.S. Sales Only.

Descriptors: (*Titanium base alloys, *Phase transformations), (*Aluminium alloys, Phase transformations), (*Vanadium alloys, Phase transformations), (*Tin alloys, Phase transformations), Hardness, High temperature, Martensite, Mechanical properties, Very high temperature.

For abstract, see NSA 30 08, number 21651.

COM-74-50880/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
DUCTILE VERSUS BRITTLE BEHAVIOUR OF CRYSTALS.
Final rept.,
James R. Rice, and Robb M. Thomson. Jan 74, 25p
Pub. in The Philosphical Magazine, v29 n1 p73-97 Jan 74.

Descriptors: *Fracture(Mechanics), *Crystal dislocations, Brittleness, Metals, Crack propagation, Crystal structure, Iron.

A necessary criterion for brittle fracture in crystals is established in terms of the spontaneous emission of dislocations from an atomically sharp cleavage crack. The authors have calculated the stability of a sharp crack against emission of a blunting dislocation for a number of crystals and crystal types in two dimensions and the energy to form a stable loop of dislocation from the crack tip in three dimensions. It is found that contrary to previous expectations, an atomically sharp cleavage crack is stable in a wide range of crystal types, but that in the face centered cubic metals investigated, blunting reactions occur spontaneously. Of the body centered metals investigated, iron is an intermediate case between the brittle and ductile cases, and the ionic and covalent crystals investigated are all stable against dislocation emission.

COO-1198-1070 PC$6.75/MF$2.25
Illinois Univ., Urbana Materials Research Lab.
SCIENCE OF MATERIALS. ANNUAL PROGRESS REPORT.
Mar 74, 71p
Contract AT(11-1)-1198

Descriptors: (*Transition element compounds, *Electronic structure), (*Alloys, Electronic structure), (*Films, *Phase transformations), (*Metals, *Dislocations), Anharmonic crystals, Bcc lattices, Composite materials, Deformation, Electron beams, Electron microscopy, Heat resisting alloys, Intermetallic compounds, Interstitials, Magnetic properties, Mechanical properties, Molecular crystals, Nuclear magnetic resonance, Physical properties, Physical radiation effects, Point defects, Precipitation, Rare gases, Refractories, Research programs, Solid solutions, Solids, Stress corrosion, Temperature dependence, Ultralow temperature, Very high pressure, Very high temperature.

For abstract, see NSA 30 08, number 21652.

COO-1198-1073 PC$9.50/MF$2.25
Illinois Univ., Urbana.
STUDY OF PRECIPITATION IN COPPER+13 ATOMIC PERCENT BERYLLIUM BY NUCLEAR MAGNETIC RESONANCE AND FIELD ION MICROSCOPY.
A. C. C. Yen. Jun 74, 126p
Contract AT(11-1)-1198

Descriptors: (*Copper base alloys, *Precipitation), (*Beryllium alloys, Precipitation), Aging, Binary alloy systems, High temperature, Intermetallic compounds, Ion microscopy, Knight shift, Nuclear magnetic resonance, Phase transformations.

For abstract, see NSA 30 08, number 21653.

COO-1198-1077 PC$7.75/MF$2.25
Illinois Univ., Urbana.
LOW TEMPERATURE INTERNAL FRICTION IN THE NIOBIUM--HYDROGEN AND NIOBIUM--OXYGEN--HYDROGEN SYSTEMS.
R. F. Mattas. May 74, 93p
Contract AT(11-1)-1198

Descriptors: (*Niobium, *Sorptive properties), (*Oxygen, *Diffusion), (*Hydrogen, Diffusion), (*Deuterium, Diffusion), Adsorption, Deuterium compounds, Dislocations, Hydrides, Internal friction, Low temperature, Medium temperature, Niobium compounds, Oxides, Pulse techniques.

For abstract, see NSA 30 08, number 21654.

COO-1198-1081 PC$8.50/MF$2.25
Illinois Univ., Urbana.
ELECTRON MICROSCOPY STUDY OF CARBIDE PRECIPITATION IN A VANADIUM--TITANIUM ALLOY.
C. P. Fluhr. May 74, 106p
Contract AT(11-1)-1198

Descriptors: (*Vanadium alloys, *Solid solutions), (*Titanium alloys, Solid solutions), (*Vanadium carbides, *Precipitation), (*Titanium carbides, Precipitation), Electron microscopy, Hcp lattices, Order parameters, Superlattices, Supersaturation, Thickness.

For abstract, see NSA 30 08, number 21512.

COO-2313-1 PC$4.25/MF$2.25
Colorado School of Mines, Golden.
LIQUID LITHIUM CORROSION RESEARCH. PROGRESS REPORT, APRIL 1, 1973--DECEMBER 31, 1974.
D. L. Olson, and W. L. Bradley. 1974, 25p
Contract AT(11-1)-2313

Descriptors: (*Lithium, *Corrosive effects), (*Stainless steel-304l, *Corrosion), Controlled atmospheres, Gloveboxes, Grain boundaries, Laboratory equipment, Liquid metals, Research programs, Stainless steel-304, Very high temperature, Welded joints.

For abstract, see NSA 30 08, number 21590.

COO-3429-22 PC$4.00/MF$2.25
Pittsburgh Univ., Pa. Dept. of Chemistry.
MAGNETIZATION STUDIES ON TM SUB 2 FE/SUB 17-X/CO/SUB X/ AND TM SUB 2 FE/SUB 17-X/AL/SUB X/ COMPOUNDS.
K. S. V. L. Narasimhan, W. E. Wallace, and R. D. Hutchens. 1973, 4p

Descriptors: (*Thulium alloys, *Magnetic susceptibility), (*Iron alloys, Magnetic susceptibility), (*Cobalt alloys, Magnetic susceptibility), (*Aluminium alloys, Magnetic susceptibility), Anisotropy, Curie point, Intermetallic compounds, Lattice parameters, Spin orientation, Ternary alloy systems, Ultralow temperature, Very high temperature.

For abstract, see NSA 30 08, number 21655.

DP-MS-73-71 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
SORPTION OF TRITIUM BY NICKEL DURING PLASTIC DEFORMATION.
J. A. Donovan. 19p CONF-740535-1
Contract AT(07-2)-1

Descriptors: (*Nickel, *Sorptive properties), (*Tritium, *Adsorption), Deformation, Diffusion, Dislocations, Plasticity, Trapping, Tubes.

For abstract, see NSA 30 08, number 21513.

DP(NASA)-1253 PC$4.25/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
ROLE OF HYDROGEN IN HOT-SALT STRESS CORROSION CRACKING OF TITANIUM--ALUMINUM ALLOYS.
R. S. Ondrejcin. Jun 71, 22p
Contract AT(07-2)-1

Descriptors: (*Titanium alloys, *Stress corrosion), (*Aluminium alloys, Stress corrosion), Accelerators, Chemical reactions, Cracking, Embrittlement, Hydrogen, Hydrogen ions, Mechanical properties, Salts, Water.

For abstract, see NSA 30 08, number 23406.

FOA-4-C-4547-A2 PC$6.75/MF$2.25
Foersvarets Forskningsanstalt, Stockholm (Sweden).
MAGNETISM AND THE LANTHANIDES.
B. Johansson, and A. Rosengren. Jul 73, 73p
In Swedish. U.S. Sales Only.

Descriptors: (*Rare earths, *Magnetic properties), Antiferromagnetism, Crystal structure, Exchange interactions, Ferromagnetism, Lasers, Magnetic storage devices, Paramagnetism, Permanent magnets.

For abstract, see NSA 30 08, number 21656.

FRNC-TH-493 PC$7.75/MF$2.25
Grenoble-1 Univ., 38 (France).
MECHANICAL PROPERTIES OF PURE IRON IRRADIATED AT LOW TEMPERATURES. IRRADIATION SOFTENING MECHANISM.
F. Vanoni. 1973, 93p
In French. U.S. Sales Only.

Descriptors: (*Iron, *Mechanical properties), Annealing, Electron beams, Interstitials, Low temperature, Neutron beams, Physical radiation effects, Point defects, Tensile properties, Twinning, Vacancies.

For abstract, see NSA 30 08, number 21814.

IS-T-634 PC$8.75/MF$2.25
Ames Lab., Iowa.
ELECTRICAL AND MAGNETO-ELECTRICAL RESISTIVITY OF VERY DILUTE CUCR ALLOYS.
T. A. Vyrostek. Jul 74, 114p
Contract W-7405-eng-82

Descriptors: (*Copper alloys, *Electrical properties), (*Chromium alloys, Electrical properties), Electric conductivity, Impurities, Magnetoresistance, Medium temperature, Temperature dependence.

For abstract, see NSA 30 08, number 23409.

IS-T-649 PC$14.50/MF$2.25
Ames Lab., Iowa.
EFFECT OF GEOMETRY AND SURFACE CONDENSATION ON THE BEHAVIOR OF A TORSION EFFUSION CELL.
D. A. Fitzgibbons. Aug 74, 230p
Contract W-7405-eng-82

Descriptors: (*Metals, *Thermodynamic properties), (*Liquid metals, Thermodynamic properties), Adsorption, Cylinders, Fluid flow, Geometry, Knudsen flow, Molecules, Monte carlo method, Simulation, Torsion, Vapor pressure.

For abstract, see NSA 30 08, number 23446.

IS-3405 PC$4.00/MF$2.25
Iowa State Univ. of Science and Technology, Ames.
RADIATION EFFECTS ON FRACTURE BEHAVIOR.
M. S. Wechsler. Jun 74, 7p CONF-740640-1

Descriptors: (*Metals, *Physical radiation effects), Bcc lattices, Ductile-brittle transitions, Ductility, Embrittlement, Fracture properties, Grain boundaries.

For abstract, see NSA 30 08, number 21817.

ITF-73-169P PC$5.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
FREE ENERGY OF SIMPLE METALS. I.
I. R. Yukhnovskii, P. P. Kostrobii, and Z. A. Gurskii. 1973, 49p
In Russian. U.S. Sales Only.

Descriptors: (*Minerals, *Free energy), (*Metals, Free energy), Electrons, Interactions, Ions, Wave functions.

For abstract, see NSA 30 08, number 23410.

JAERI-M-5651 PC$4.50/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
CREEP-RUPTURE PROPERTIES OF HASTELLOY-X FOR USE AS THE STRUCTURAL COMPONENTS OF OGL-1.
S. Yokoi, Y. Monma, T. Fujimura, and T. Kikuyama. Mar 74, 27p
In Japanese. U.S. Sales Only.

Descriptors: (*Hastelloy x, *Mechanical properties), Cracks, Creep, Grain boundaries, Molybdenum, Precipitation hardening, Ruptures, Temperature dependence, Welded joints.

For abstract, see NSA 30 08, number 21658.

JINR-P4-7917 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
EXACTLY SOLVABLE MODEL FOR METAL-INSULATOR PHASE TRANSITION.
I. G. Brankov, V. A. Zagrebnov, and N. S. Tonchev. 1974, 10p
U.S. Sales Only.

Descriptors: (*Metals, *Phase transformations), (*Dielectric materials, Phase transformations), Electrons, Interactions, Mathematical models, Numerical solution, Phonons, Thermodynamic properties.

For abstract, see NSA 30 08, number 23413.

JPRS-62925 PC$6.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
EVOLUTION AND IMPROVEMENT OF TOOL STEELS,
A. K. Petrov. 10 Sep 74, 158p
Trans. of mono. Instrumentalnye i Podshipnikovye Stai, Moscow, 1973 nl 136p.

Descriptors: *Tool steels, Metallurgy, Mechanical properties, Utilization, Trends, Translations, USSR.

The report contains an analysis of principal trends in achieving the efficient utilization of steels, production and development of new steels, and improvement in tool steel quality.

JUL-1045-FF PC$5.75/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Festkoerperforschung.
MODEL CALCULATION FOR THE ALPHA – ALPHA 'PHASE TRANSITION IN METAL–HYDROGEN SYSTEMS.
H. Horner, and H. Wagner. Feb 74, 52p
U.S. Sales Only.

Descriptors: (*Niobium hydrides, *Phase transformations), Atomic models, Crystal lattices, Crystal models, Monte carlo method, Phase diagrams.

For abstract, see NSA 30 08, number 21659.

KR-149 PC$7.25/MF$2.25
Institutt for Atomenergi, Kjeller (Norway).
ELECTROCHEMISTRY OF UNIFORM CORROSION AND PITTING OF ALUMINIUM.
K. Videm. 1974, 82p
U.S. Sales Only.

Descriptors: (*Aluminium, *Electrochemical corrosion), Corrosion, Electrochemistry, Kinetics, Pitting corrosion, Water.

For abstract, see NSA 30 08, number 23417.

N74-29972/8GA PC$6.75/MF$2.25
Battelle Columbus Labs., Ohio.
MATERIALS PROCESSING IN SPACE M512, PHASE B REPORT.
H. E. Pattee, and R. E. Monroe. 15 Jul 73, 74p
NASA-CR-120266
Contract NAS8-28725

Descriptors: *Microstructure, *Space manufacturing, *Weightlessness, Brazing, Materials tests, Metallography, Microanalysis, Skylab program.

For abstract, see STAR 1219

N74-29975/1GA PC$10.00/MF$2.25
Technische Universitaet, Hanover (West Germany).
INCREASED CREEP RESISTANCE STRENGTH IN ALUMINUM-NICKEL-ALLOYS BY HYDROGEN ERHOEHUNG DER DAUERSTANDFESTIGKEIT VON ALUMINIUM-NICKEL-LEGIERUNGEN DURCH WASSERSTOFF.
Ph.D. Thesis.
Y. Enokido. 1973, 137p
Language in German.

Descriptors: *Aluminum alloys, *Creep strength, *Hydrogenation, *Nickel alloys, Chemical composition, Creep rupture strength, Production engineering, Thermodynamic properties.

For abstract, see STAR 1219

N74-29976/9GA PC$10.75/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
MECHANICAL PROPERTIES OF STEEL DURING STATIC AND CYCLIC LOADING AFTER A MASSIVE DEFORMATION MECHANISCHE EIGENSCHAFTEN VON STAHL BEI STATISCHER UND WECHSELNDER BEANSPRUCHUNG.
Ph.D. Thesis.
G. Flemming. 1972, 153p
Language in German.

Descriptors: *Cold working, *Mechanical properties, *Steels, Bauschinger effect, Static loads, Transient loads.

For abstract, see STAR 1219

N74-29979/3GA PC$4.75/MF$2.25
National Aeronautical Lab., Bangalore (India).
A UNIFIED THEORY FOR THE PORTEVIN-LE CHATELIER EFFECT IN SUBSTITUTIONAL ALLOYS.
V. Srinivasan. Dec 73, 32p NAL-TN-43
Subm-Submitted for Publication.

Descriptors: *Aluminum alloys, *Gold alloys, *Indium alloys, *Magnesium alloys, *Precipitation hardening, *Zinc alloys, Dislocations (Materials), Strain rate, Velocity.

For abstract, see STAR 1219

N74-29981/9GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
DYNAMIC OXIDATION BEHAVIOR AT 1000 AND 1100 C OF FOUR NICKEL-BASE CAST ALLOYS, NASA-TRW VIA, B-1900, 713C, AND 738X.
W. A. Sanders. Aug 74, 25p NASA-TN-D-7682, E-7865

Descriptors: *Nickel alloys, *Oxidation resistance, *Thermal cycling tests, Aluminum alloys, Burners, Chromium alloys, Refractory metal alloys, Spalling, Titanium alloys.

For abstract, see STAR 1219

N74-29983/5GA PC$4.50/MF$2.25
State Univ. of New York, Stony Brook.
FREE ENERGIES OF FORMATION OF WC AND WZC AND THE THERMODYNAMIC PROPERTIES OF CARBON IN SOLID TUNGSTEN.
D. K. Gupta, and L. L. Seigle. 1974, 26p NASA-CR-139406
Contract NGR-33-015-035

Descriptors: *Free energy, *Thermodynamic properties, *Tungsten carbides, Interstitials, Refractory metals, Solid solutions.

For abstract, see STAR 1219

N74-30326/4GA PC$10.00/MF$2.25
Technische Hogeschool, Delft (Netherlands).
THE EFFECT OF CYCLIC DEFORMATION ON THE TORSIONAL MODULUS IN THE INTERNAL DAMPING OF PURE COPPER DE INVLOED VAN CYCLISCHE DEFORMATIE OP DE TORSIEMODULUS EN DE INWENDIGE DEMPING VAN ZUIVER KOPER.
Ph.D. Thesis.
R. Denbuurman. 1974, 138p
In Dutch; English Summary.

Descriptors: *Copper, *Cyclic loads, *Elastic deformation, *Internal friction, Elastic damping, Fatigue (Materials), Modulus of elasticity, Torsional stress.

For abstract, see STAR 1219

N74-30327/2GA PC$11.75/MF$2.25
Technische Universitaet, Hanover (West Germany).
COMPARISON OF MICROGEOMETRIC DIMENSIONS OF GROUND STEEL SURFACES WITH DEMANDS FOR A FUNCTIONAL THERMAL EFFECT VERGLEICH MIKROGEOMETRISCHER KENNGROESSEN ABGESPANNTER STAHLOBERFLAECHEN MIT DEN ANFORDERUNGEN DER FUNKTION THERMOWIRKUNG.
Ph.D. Thesis.
H. Bley. 1973, 173p
Language in German.

Descriptors: *Steels, *Surface roughness, *Thermal conductivity, Functional analysis, Heat transfer, Microstructure, Surface properties.

For abstract, see STAR 1219

N74-30335/5GA PC$7.25/MF$2.25
Michigan Univ., Ann Arbor. Dept. of Materials and Metallurgical Engineering.
DEFORMATION CHARACTERISTICS AND TIME-DEPENDENT NOTCH SENSITIVITY OF UDIMET 700 AT INTERMEDIATE TEMPERATURES.
Final Report.
D. J. Wilson. Mar 74, 81p NASA-CR-134613, REPT-043680-20-F
Contract NGL-23-005-005

Descriptors: *Notch sensitivity, *Time dependence, *Udimet alloys, Deformation, Mechanical properties, Yield strength.

For abstract, see STAR 1219

N74-30987/3GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
EFFECT OF PLASTIC DEFORMATION AND PHASE TRANSFORMATIONS AT NEGATIVE TEMPERATURES ON THE PROPERTIES OF TITANIUM ALLOYS.
I. N. Bogachev, M. A. Dyakova, A. K. Bezrukova, and S. I. Selitskaya. Aug 74, 9p NASA-TT-F-15477
Contract NASW-2481
Tran-Transl. Into English from the Book "Vliyaniye Plasticheskoy Deformatsii I Fazovykh Prebrascheniy Pri Otritsatelnykh Temperaturakh NA Svoystva Splavov Titana" Moscow, Nauka Press, 1972 p 104-108.

Descriptors: *Phase transformations, *Plastic deformation, *Subzero temperature, *Titanium alloys, Cold hardening, Expansion, Martensite, Mechanical properties, Solid solutions.

For abstract, see STAR 1220

N74-30991/5GA PC$5.00/MF$2.25
Lockheed Missiles and Space Co., Huntsville, Ala.
BEADING AND SPIKING PHENOMENA IN THE M551 METALS MELTING EXPERIMENT.
Addendum to Final Report.
C. Fan, and M. R. Brashears. 1 May 74, 36p
NASA-CR-120352, LMSC-HREC-TR-D-390181-AD
Contract NAS8-28729

Descriptors: *Skylab program, *Space manufacturing, *Stainless steels, *Tantalum, Gravitational effects, Vapor pressure, Vortex streets, Weightlessness.

For abstract, see STAR 1220

N74-30992/3GA PC$7.25/MF$2.25
Erlangen-Nuremberg Univ. (West Germany).
THE DEVELOPMENT OF THE DISLOCATION STRUCTURE AND ITS EFFECT ON THE DEFORMATION BEHAVIOR IN ALUMINUM DIE AUSBILDUNG DER VESETZUNGSSTRUKTUR UND DEREN BEZIEHUNGEN ZUM VERFORMUNGSVERHALTEN IN ALUMINIUM.
Ph.D. Thesis.
F. Schuh. 1973, 83p
Language in German.

Descriptors: *Aluminum, *Crystal dislocations, *Crystal structure, *Deformation, *Hot working, Plastic deformation, Residual stress, Stress relaxation, Temperature effects, Yield strength.

For abstract, see STAR 1220

N74-30993/1GA PC$12.50/MF$2.25
Technische Hochschule, Hanover (West Germany).
STRUCTURAL CHANGES IN 50CRMO STEEL CAUSED BY THERMAL WORK HARDENING EIGENSCHAFTSAENDERUNGEN DES STAHLS 50CRMO6 DURCH WARMFORMVERGUETEN.
Ph.D. Thesis.
B. Snoeijer. 1973, 187p
Language in German.

Descriptors: *Chromium steels, *Hot working, *Mechanical properties, Austenite, Phase transformations, Recrystallization, Thermomechanical treatment.

For abstract, see STAR 1220

N74-30995/6GA PC$14.00/MF$2.25
Cologne Univ. (West Germany).
THE BRITTLE FRACTURE MECHANISM AND THE PHYSICAL CAUSES FOR THE DIFFERENTIAL GRADING OF STEELS BY THEIR TRANSITION TEMPERATURES DER MECHANISMUS DES SPROEDBRUCHES UND DIE PHYSIKALISCHEN URSACHEN DER UNTERSCHIEDLICHEN EINSTUFUNG DER STAEHLE AND HAND IHRER UEBERGANGSTEMPERATUREN.
Ph.D. Thesis.
W. Fink. 1973, 217p
Language in German.

Descriptors: *Crystal structure, *Fracture strength, *Heat treatment, *Steels, Brittleness, Crack initiation, Grains, Mechanical properties, Phase transformations.

For abstract, see STAR 1220

N74-30997/2GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
STRUCTURAL TRANSFORMATIONS IN TWO-PHASE TITANIUM ALLOYS.
E. V. Polyak, A. Y. Sokolova, I. I. Kornilov, and N. G. Boriskina. Jul 74, 8p NASA-TT-F-15468
Contract NASW-2481
Tran-Transl. Into English from the Book "Novyy Konstruktsionnyy Material: Titan" USSR, Nauka Press, 1972 p 66-70.

Descriptors: *Aging (Materials), *Annealing, *Crystal defects, *Microstructure, *Phase diagrams, *Phase transformations, *Quenching (Cooling), *Titanium alloys.

For abstract, see STAR 1220

N74-30998/0GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
EFFECT OF PLASTIC DEFORMATION AND ALLOYING WITH SMALL ADDITIONS OF OXYGEN ON THE DECOMPOSITION OF METASTABLE BETA-PHASE IN THE ALLOY TS6.
P. M. Lerinman, G. V. Murzayev, M. A. Nikanorov, K. I. Khyostyntsev, and I. I. Kornilov. Aug 74, 14p NASA-TT-F-15472
Contract NASW-2481
Tran-Transl. Into English from the Book "Novyy Konstruktsionnyy Material: Titan" Moscow, Nauka Press, 1972 p 81-88.

Descriptors: *Aluminum alloys, *Iron alloys, *Molybdenum alloys, *Pyrolysis, *Vanadium alloys, Chemical reactions, Microstructure, Oxidation, Phase transformations.

For abstract, see STAR 1220

N74-30999/8GA PC$4.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
EFFECT OF TEMPERATURE ON THE PLASTICITY OF TITANIUM.
L. S. Moroz, S. S. Ushkov, I. I. Kornilov, and N. G. Boriskina. Aug 74, 9p NASA-TT-F-15473
Contract NASW-2481
Tran-Transl. Into English from the Book "Titan (A New Construction Material: Titanium)" Moscow, Nauka Press, 1972 p 89-93.

Descriptors: *Metal working, *Plastic deformation, *Temperature effects, *Titanium, Elongation, Mechanical properties, Physical properties.

For abstract, see STAR 1220

N74-31000/4GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
PROPERTIES OF ALLOY 4201 AT ELEVATED TEMPERATURES.
A. T. Pronin, N. G. Boriskina, Y. I. Oginskaya, S. V. Moroznikova, and V. A. Yermishkin. Aug 74, 7p NASA-TT-F-15474
Contract NASW-2481
Tran-Transl. Into English from the Book "Novyy Konstruktsionnyy Material: Titan" Moscow, Nauka Press, 1972 p 93-97.

Descriptors: *Crystal structure, *Heat treatment, *Metal working, *Molybdenum alloys, *Titanium alloys, Mechanical properties, Metal crystals, Physical properties, Temperature effects.

For abstract, see STAR 1220

N74-31001/2GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
MECHANISM OF THE INHIBITED FAILURE OF PLASTIC TITANIUM ALLOYS.
V. N. Meshcheryakov, M. K. Shorshorov, I. I. Kornilov, and N. G. Boriskina. Aug 74, 11p NASA-TT-F-15475
Contract NASW-2481
Tran-Transl. Into English from the Book "Novyy Konstruktsionnyy Material: Titan" USSR, Nauka Press, 1972 p 97-100.

Descriptors: *Elastic properties, *Failure analysis, *Fatigue (Materials), *Fracture mechanics, *Plastic deformation, *Titanium alloys, Materials tests, Mechanical properties, Physical properties.

For abstract, see STAR 1220

N74-31003/8GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
CHARACTERISTICS OF THE EFFECT OF ALUMINUM ON THE MECHANICAL PROPERTIES OF TITANIUM.
L. S. Moroz, I. N. Razuvayeva, and S. S. Ushkov. Aug 74, 11p NASA-TT-F-15478
Contract NASW-2481
Tran-Transl. Into English from the Book "Novyy Konstruktsionnyy Material: Titan" USSR, Nauka Press, 1972 p 109-114.

Descriptors: *Aluminum alloys, *Mechanical properties, *Titanium alloys, Brittleness, Ductility, Plastic properties, Solid phases.

For abstract, see STAR 1220

N74-31004/6GA PC$6.00/MF$2.25
United Aircraft Corp., East Hartford, Conn. Research Labs.
PROCESSING EUTECTICS IN SPACE.
Final Report, 8 Jun. 1973 - 8 Jul. 1974.
F. C. Douglas, and F. S. Galasso. 8 Jul 74, 58p
NASA-CR-120391, N911721-12
Contract NAS8-29669

Descriptors: *Eutectics, *Metal working, *Space laboratories, *Space manufacturing, *Weightlessness, Materials tests, Mechanical properties, Microstructure, Physical properties.

For abstract, see STAR 1220

N74-31005/3GA PC$9.75/MF$2.25
Rice Univ., Houston, Tex.
STRESS CORROSION IN TITANIUM ALLOYS AND OTHER METALLIC MATERIALS.
Final Report, 1 Jun. 1968 - 30 Sep. 1971.
C. G. Harkins, F. R. Brotzen, J. W. Hightower, R. B. Mclellan, and J. M. Roberts. 30 Sep 71, 133p
NASA-CR-139562
Contracts NGR-44-006-088, NGL-44-006-033

Descriptors: *Spectroscopic analysis, *Stress corrosion cracking, *Titanium alloys, *Titanium oxides, Alcohols, Electron microscopes, X ray analysis.

For abstract, see STAR 1220

N74-31357/8GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
PHASE AND STRUCTURAL VARIATIONS IN TITANIUM UNDER TRANSIENT LOADS.
P. O. Pashkov, B. Y. Gokhshteyn, and I. I. Polyakova. Jul 74, 7p NASA-TT-F-15469
Contract NASW-2481
Tran-Transl. Into English from the Book "Fazovyye I Strukturnyye Izmenemiya V Titane Pri Impulsivnykh Nagruzkakh" Moscow, Nauka Press, 1972 p 70-73.

Descriptors: *Phase transformations, *Titanium, *Transient loads, High pressure, High temperature, X ray diffraction.

For abstract, see STAR 1220

ORNL-SUB-3654-1 PC$7.75/MF$2.25
Babcock and Wilcox Co., Alliance, Ohio Research Center.
CREEP FAILURE UNDER UNIAXIAL AND MULTIAXIAL STRESS CONDITIONS. ANNUAL REPORT, JANUARY 1, 1972--DECEMBER 31, 1972. R AND D REPORT LR:72:4213-01:1.
C. C. Schultz, and W. E. Leyda. 15 Mar 74, 82p

Descriptors: (*Stainless steel-304, *Creep), Annealing, Failures, Forecasting, High temperature, Pressure vessels, Ruptures, Strains, Stresses, Time dependence.

For abstract, see NSA 30 08, number 21664.

ORNL-TM-4543 PC$4.25/MF$2.25
Oak Ridge National Lab., Tenn.
THERMODYNAMICS OF PRECIPITATION REACTIONS IN TITANIUM-MODIFIED STAINLESS STEEL.
J. M. Leitnaker, and R. E. Gehlbach. Jul 74, 21p
Contract W-7405-eng-26

Descriptors: (*Stainless steel-316, *Thermodynamics), (*Titanium alloys, Thermodynamics), Carbon, Chemical reactions, Formation heat, Nitrogen, Precipitation, Sulfur, Very high temperature.

For abstract, see NSA 30 08, number 23423.

ORNL-TM-4604 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
EFFECTS OF NEUTRON IRRADIATION UPON METALLOGRAPHIC MOUNTING MATERIALS.
R. E. Reed, E. D. Bolling, and J. F. Emery. Aug 74, 17p
Contract W-7405-eng-26

Descriptors: (*Epoxides, *Physical radiation effects), (*Araldite, Physical radiation effects), Aluminium oxides, Autoradiography, Dimensions, Impurities, Metallography, Neutron beams, Stability, Supports.

For abstract, see NSA 30 08, number 21838.

ORNL-TM-4621 PC$4.25/MF$2.25
Oak Ridge National Lab., Tenn.
LOW-PRESSURE OXIDATION OF T-111 AND EFFECT ON TENSILE PROPERTIES.
H. Inouye, and C. T. Liu. Aug 74, 25p
Contract W-7405-eng-26

Descriptors: (*Tantalum alloy-t111, *Oxidation), Chemical reaction kinetics, Ductility, Strain hardening, Tensile properties, Very high temperature.

For abstract, see NSA 30 08, number 21592.

PAT-APPL-483 858 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
METHOD AND APPARATUS FOR TENSILE TESTING OF METAL FOIL.
Patent Application.
O. W. Wade. Filed 27 Jun 74, 14p NASA-CASE-LAR-10208-1
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Load testing machines, *Metal foils, *Tensile tests, Alignment, Boxes (Containers), Edges, *Patent applications.

A method is described whereby accurate, reproducible results are obtained in the tensile testing of thin metal foils. The method consists of working the side edges of the test specimen until the edges are parallel and flaw-free, aligning the work specimen between space grip end members, and securing end portions of the aligned test specimen to the grip end members. An aligning apparatus employed in the method consists of an alignment box having a longitudinal bottom wall and two upright side walls with the first and second removable grip end members disposed at each end of the box, and with a means for securing the grip end members within the box. The grip end members are provided with means for receiving opposite end portions and aligning the test specimen.

PATENT-3 791 945 Not available NTIS
Atomic Energy Commission, Washington, D.C.
METHOD OF PRODUCTION OF ALKALI METALS AND THEIR ALLOYS.
Patent,
Charles W. Tobias, and Jacob Jorne. Filed 22 Feb 73, patented 12 Feb 74, 4p PAT-APPL-334 825
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electrometallurgy, *Alkali metals, *Patents, Electrodeposition, Lithium, Sodium, Potassium, Rubidium, Cesium, Mercury amalgams, Electrolysis.
Identifiers: PAT-CL-204-59-AM.

The patent relates to an impure amalgam of an alkali metal or mixture thereof produced by electrolysis. The amalgam is then transferred to an electrolytic cell containing propylene carbonate with an appropriate salt (or salts) of the alkali metal (or metals), e.g. of ClO4(-), BF4(-), PF6(-), Cl(-), Br(-), I(-), with or without added AlCl3. Then, with appropriate voltage, current and other conditions, one or more selected alkali metals is anodically dissolved to yield a pure metal or selected metal mixture by electrodeposition.

PATENT-3 794 532 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SPHERODIZATION OF GRAIN BOUNDARY PRECIPITATES.
Patent,
Russell H. Jones, Earl R. Parker, and Victor F. Zackay. Filed 14 Mar 72, patented 26 Feb 74, 5p PAT-APPL-234 483
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Iron alloys, *Heat treatment, *Patents, Grain boundaries, Spheroidal structure, Tantalum containing alloys, Chromium containing alloys, Ductility, Yield strength.
Identifiers: PAT-CL-148-142.

The patent discloses a method for spheroidizing grain boundary precipitates by cycling through the alpha-gamma phase transformation, wherein both the ductility and strength of the material are increased. The inventive spheriodization process is applicable to the binary system, such as Fe-Ta. In addition, it has been discovered that the addition of selected amounts of chromium on the Fe-Ta binary system (Fe-Ta-Cr alloy) enhanced spheroidization as well as improved oxidation resistance, while lowering the heat treatment temperature.

PATENT-3 826 726 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PRODUCTION OF PURE METALS.
Patent.
W. H. Philipp, S. J. Marsik, and C. E. May. Patented 30 Jul 74, 4p PAT-APPL-245 279
Misc-Filed 18 Apr. 1972 Supersedes N72-25164 (10 - 16, p 2119). Subm-Continuation-in-Part of US Patent Appl. Sn-876588, Filed 13 Nov. 1969.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Deposition, *Irradiation, *Metals, *Precipitation (Chemistry), Aqueous solutions, Chemical compounds, * Patents.
Identifiers: PAT-CL-204-157.

A process for depositing elements by irradiating liquids is reported. Ultra pure elements are precipitated from aqueous solutions or suspensions of compounds. A solution of a salt of a metal to be prepared is irradiated, and the insoluble reaction product settles out. Some chemical compounds may also be prepared in this manner.

PB-235 770/5GA PC$3.75/MF$2.25
National Environmental Research Center, Cincinnati, Ohio.
ALUMINUM AS A COMPONENT OF SOLID WASTE AND A RECOVERABLE RESOURCE.
Final rept.,
Ronald J. Talley, and Richard H. Ongerth. Sep 74, 39p* EPA-670/5-74-005

Descriptors: *Aluminum industry, *Solid waste disposal, *Reclamation, Metal scrap, Refuse, Utilization, Demand(Economics), Supply(Economics), Economic analysis.
Identifiers: *Scrap recycling, Secondary materials industry.

This report surveys the production and use of aluminum and its occurrence in solid waste; the aspects related to resource recovery are emphasized. Surveyed are both the primary and secondary aluminum industries, which produce aluminum from virgin materials (i.e., bauxite) and scrap, respectively. Supply and demand analysis is used to analyze fluctuations in scrap prices and implications of increased recovery of aluminum from solid waste.

RFP-2067 PC$4.00/MF$2.25
Dow Chemical Co., Denver, Colo. Rocky Flats Div.
EFFECT OF INNOCULATION OF URANIUM AND URANIUM–6 WEIGHT PERCENT NIOBIUM WITH 0.01 TO 1.0 WEIGHT PERCENT TITANIUM ON IMPURITY LEVELS.
J. G. Avery. 5 Jul 74, 8p
Contract AT(29-1)-1106

Descriptors: (*Uranium, *Purification), (*Uranium base alloys, Purification), (*Niobium alloys, Purification), (*Inclusions, *Removal), Carbon, Impurities, Nitrogen, Oxygen, Separation processes, Titanium additions.

For abstract, see NSA 30 08, number 21669.

RFP-2207 PC$4.00/MF$2.25
Dow Chemical Co., Denver, Colo. Rocky Flats Div.
ORGANIC COATING OF URANIUM–4.2 WEIGHT PERCENT NIOBIUM.
R. L. Riegel. 24 Jun 74, 16p
Contract AT(29-1)-1106

Descriptors: (*Uranium base alloys, *Corrosion protection), (*Niobium alloys, Corrosion protection), (*Epoxides, *Deposition), (*Polyesters, Deposition), Adhesion, Chemical composition, Stress corrosion, Thickness, Urethane.

For abstract, see NSA 30 08, number 21593.

SLL-74-0208 PC$4.75/MF$2.25
Sandia Labs., Livermore, Calif.
EFFECTS OF SURFACE OXIDES ON THE PERMEATION OF DEUTERIUM THROUGH 309S STAINLESS STEEL.
W. A. Swansiger, R. G. Musket, L. J. Weirick, and W. Bauer. Jun 74, 31p
Contract AT(29-1)-789

Descriptors: (*Stainless steels, *Permeability), (*Deuterium, *Diffusion), Auger effect, Electron spectroscopy, High temperature, Oxides, Surface properties.

For abstract, see NSA 30 08, number 23430.

TID-26595 PC$4.00/MF$2.25
Wayne State Univ., Detroit, Mich.
OUTGASSING CHARACTERISTICS OF METALS AND ALLOYS. FINAL REPORT, FEBRUARY 16, 1971–FEBRUARY 15, 1972.
L. Himmel. 1972, 10p
Contract AT(11-1)-2120

Descriptors: (*Molybdenum alloys, *Degassing), (*Carbon additions, Degassing), (*Zirconium alloys, *Nitridation), (*Hafnium alloys, Nitridation), Desorption, Diffusion, Hafnium nitrides, Nitrogen, Vacuum systems, Zirconium nitrides.

For abstract, see NSA 30 08, number 21670.

UCID-16491 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
ALGORITHMS FOR REDUCING YTTERBIUM.
J. R. Hearst. 22 May 74, 15p
Contract W-7405-eng-48

Descriptors: (*Ytterbium, *Piezoelectricity), Algorithms, Electric bridges, G codes, Stress analysis, Time dependence.

For abstract, see NSA 30 08, number 21671.

UCRL-51544 PC$5.45/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
FRACTURE TOUGHNESS OF THIN BERYLLIUM SHEET.
G. E. Jr. Tardiff. 28 Feb 74, 154p
Contract W-7405-eng-48

Descriptors: (*Beryllium, *Fracture properties), Cracks, Grain orientation, Grain size, Microstructure, Powder metallurgy, Recrystallization, Sheets, Stresses, Thickness, Yield strength.

For abstract, see NSA 30 08, number 21672.

UCRL-51575 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
MODIFICATION OF THE GRAY EQUATION OF STATE IN THE LIQUID-VAPOR REGION.
D. A. Young. 15 Apr 74, 32p
Contract W-7405-eng-48

Descriptors: (*Solids, *Equations of state), (*Beryllium, Equations of state), (*Niobium, Equations of state), (*Tungsten, Equations of state), G codes, Liquids, Pressure dependence, Van der waals forces, Vapors.

For abstract, see NSA 30 08, number 21673.

11G. Miscellaneous Materials

BDX-613-1178(Rev.) PC$4.50/MF$2.25
Bendix Corp., Kansas City, Mo.
EVALUATION OF A HIGH-TEMPERATURE SYNTACTIC FOAM.
H. M. McIlroy. Aug 74, 25p
Contract AT(29-1)-613

Descriptors: (*Foams, *Molding), (*Resins, Molding), (*Benzimidazoles, Molding), Balloons, Glass, High temperature, Mechanical properties, Medium temperature, Performance testing, Physical properties, Plastics, Thermodynamic properties.

For abstract, see NSA 30 08, number 23404.

PATENT-3 793 204 Not available NTIS
Atomic Energy Commission, Washington, D.C.
THERMAL INSULATION.
Patent,
Zane L. Ardary, David H. Sturgis, and Carl D. Reynolds. Filed 28 Jul 72, patented 19 Feb 74, 5p
PAT-APPL-276 209
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Thermal insulation, *Patents, Heat transfer, Carbon fibers, Starch, Graphite, Binders(Materials), Aerospace life support systems.
Identifiers: PAT-CL-252-62.

In the patent the thermal insulating properties of fibrous thermal insulation are improved for high temperature applications by incorporating graphite flakes in the insulation to substantially reduce radiant heat transfer. A binder of carbonized starch and Graphite flakes are oriented in the insulation with the greatest surface area of the flakes being disposed normal to the direction of radiant heat transfer. Thermal insulation is required for the protection of heat-sensitive systems and personnel when exposed to high temperature environments such as encountered in aerospace operations.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-785 719/6GA PC$7.00/MF$2.25
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
ENGINE-LUBRICANT COMPATIBILITY TESTS ON MIL-L-21040 OIL USING ENGINE MODEL 6V53T.
Interim rept. Sep 72-Jun 73,
S. J. Lestz. Jun 74, 183p Rept no. AFLRL-29
Contracts DAAD05-70-C-0250, DAAK02-73-C-0221

Descriptors: *Tanks(Combat vehicles), *Tank engines, *Lubricating oils, Diesel engines, Lubricants, Engine components, Compatibility.
Identifiers: MIL-L-2104C lubricating oil, 6V53T engines, M-551 vehicles.

A high-output two-cycle diesel engine model 6V53T was subjected to a targeted 210-hour laboratory-dynamometer endurance test cycle using three different MIL-L2104C SAE grade 30 engine lubricants. The significance of this test procedure is such that it was shown to relate to vehicle performance during the early 1960's. Current laboratory engine test results show that this engine may not be compatible with all MIL-L-2104C lubricants when operating with reference Number 2 diesel fuel (0.42 percent natural sulfur). This is based on the observation of severe piston, ring, and liner scuffing (and scoring) with one lubricant, and borderline acceptable performance with a second lubricant. Only one lubricant tested demonstrated desirable high-level engine compatibility. Recommendations for additional testing are made. (Author)

AD-785 983/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
NORTHERN AND WINTER OILS FOR DIESEL ENGINES.
G. Belyanchikov, M. Borovaya, Yu. Lisenkov, N. Puchkov, and V. Shkolnikov. 26 Feb 74, 11p Rept no. FSTC-HT-23-1542-73
Trans. of Neftyanik (USSR) n6 p11-13 1972.

Descriptors: *Diesel engines, *Oils, Lubricating oils, Diesel fuels, Cold weather tests, Translations, USSR, Additives.

A report into tests of oils for use in cold regions. Various oils, prepared with a number of additives, underwent laboratory and actual testing. Sample oils were investigated, and results are tabulated in detail throughout the report.

AD-786 235/2GA PC$3.25/MF$2.25
Framan Distributors Ltd Watford (England)
A CRITICAL ANALYSIS OF VISCOSITY MEASUREMENTS MADE ON AN IMPACT VISCOMETER.
Final rept.,
Graham R. Paul, A. Cameron, and R. C. Gentle. 7 Jan 74, 24p
Contract N00014-73-C-0106

Descriptors: *Viscosity, *Lubricants, Numerical analysis, Drop tests, Time dependence, Viscoelasticity, Pressure, Great Britain.
Identifiers: *Viscometers.

Previous studies have generated a considerable amount of viscometric data on several lubricants which shows that the phenomenon of viscosity saturation found in earlier tests at lower pressures appears to be general. Providing a high enough pressure is applied and the time scale of the measurements is short enough, it is probably true that all lubricants will reach a limiting viscosity as measured on the dropping ball viscometer. Recent viscosity measurements on a long time scale by other workers have detected no evidence of this phenomenon on one of the test fluids. The task of the authors' research was therefore to consider whether the dropping ball data could be consistently in error, or whether there was a general physical explanation, for viscosity reaching a limit. Presented is a critical examination of the experimental errors and the assumptions involved in calculating viscosity from the entrapment data. Following this, four possible physical models are considered which have met with some success in predicting another aspect of high pressure fluid properties on short time scales - traction in elastohydrodynamic rolling/sliding contacts.

N74-29636/9GA PC$12.50/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
THE CALCULATION OF PHYSICAL AND THERMODYNAMIC CHARACTERISTICS OF PRESSURE FLUIDS, AND THE DETERMINATION OF THE OVERALL EFFECTIVENESS IN PUMPS CONSIDERING THE PRESSURE FLUID THERMODYNAMICS DIE BERECHNUNG PHYSIKALISCHER UND THERMODYNAMISCHER KENNWERTE VON DRUCKFLUESSIGKEITEN SOWIE DIE BESTIMMUNG DES GESAMTWIRKUNGSGRADES AN PUMPEN UNTER BERUECKSICHTIGUNG DER THERMODYNAMIK FUER DIE DRUCKFLUESSIGKEIT.
Ph.D. Thesis.
K. Witt. 8 Feb 74, 187p
Language in German.

Descriptors: *Hydraulic equipment, *Hydraulic fluids, *Thermodynamic properties, *Thermophysical properties, Crude oil, Effectiveness, Mixtures, Naphthenes, Numerical analysis, Paraffins, Pressure effects.

For abstract, see STAR 1219

N74-29877/9GA PC$10.50/MF$2.25
Technische Universitaet, Brunswick (West Germany).
STUDIES ON ELASTOHYDRODYNAMIC LUBRICATING FILM THICKNESS FOR ELLIPTICAL HERTZ SURFACE CONTACTS UNTERSUCHUNGEN UEBER DIE ELASTOHYDRODYNAMISCHE SCHMIERFILMDICKE BEI ELLIPTISCHEN HERTZSCHEN KONTAKTFLAECHEN.
Ph.D. Thesis.
P. Brueser. 1972, 146p
Language in German.

Descriptors: *Elastic properties, *Film thickness, *Hydrodynamics, *Lubricants, *Rolling contact loads, Compressibility effects, Metal surfaces, Numerical analysis, Roller bearings, Viscous fluids.

For abstract, see STAR 1219

N74-29879/5GA PC$10.75/MF$2.25
Technische Universitaet, Hanover (West Germany).
BEHAVIOR AND EFFECTIVENESS OF LUBRICANTS IN DROP FORGING OF STEEL VERHALTEN UND WIRKUNGSWEISE VON SCHMIERSTOFFEN BEIM GESENKSCHMIEDEN VON STAHL.
Ph.D. Thesis.
E. Schlomach. 1973, 152p
Language in German.

Descriptors: *Forging, *Lubricants, *Spray characteristics, *Steels, Additives, Coatings, Friction reduction, Lubrication, Metal surfaces, Surface layers.

For abstract, see STAR 1219

N74-29929/8GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TRACTION AND FILM THICKNESS MEASUREMENTS UNDER STARVED ELASTOHYDRODYNAMIC CONDITIONS.
L. D. Wedeven. 1974, 35p NASA-TM-X-71584, E-8036
Conf-Proposed for Presentation at the Lubrication Conf., Montreal, 8-10 Oct. 1974; Sponsored by Asme and AM. Soc. Of Lubrication Engr.

Descriptors: *Elastohydrodynamics, *Film thickness, *Friction measurement, *Optical measurement, Boundary layers, Lubricants, Shear properties.

For abstract, see STAR 1219

11I. Plastics

AD-785 634/7GA PC$3.25/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
EFFECT OF INTERLAYER ON IMPACT RESISTANCE OF ACRYLIC/POLYCARBONATE LAMINATES,
Joyce L. Illinger, Robert W. Lewis, and Dennis B. Barr. 1972, 16p

Descriptors: *Impact strength, *Laminated plastics, *Windshields, *Armor, Polycarbonates, Polyacrylates, Polymethyl methacrylate, Ballistics, Aircraft, Microstructure, Microscopy, Electron microscopy, Spallation, Spheres.
Identifiers: Transmission electron microscopy, Interlayers.

Acrylic/polycarbonate laminates for aircraft windshield applications fabricated using transparent flexible polyurethane adhesive interlayers have demonstrated ballistic resistance up to forty-five percent greater than polycarbonate, currently considered the best commercially available transparent impact-resistant material. Optical and transmission electron microscopy show that the translucent and opaque materials have spherulitic structures which are few in numbers at low 'hard' segment concentration and densely packed at high concentration. So long as the materials showed no spherulitic structure, no real variation in ballistic performance was found with increasing 'hard' segment. The mode of failure of these laminates was ductile contrary to thermally bonded laminates or laminates using a brittle adhesive, thereby eliminating the spallation problem inherent in the use of monolithic acrylic windshields. Thus, as long as spherulitic formation can be prevented, the ballistic resistance of polyurethane interlayered plastic laminates is superior to all other transparent plastic systems (polymethyl methocrylate).

AD-786 072/9GA Reprint
Massachusetts Univ Amherst Dept of Chemistry
RHEO-OPTICAL AND DIELECTRIC STUDIES OF THE ALPHA LOSS REGION OF LOW-DENSITY POLYETHYLENE.
Richard S. Stein. 17 Jan 73, 14p AROD-10645.6-C
Grant DA-ARO-D-31-124-72-G161
Sponsored in part by National Science Foundation, Washington, D.C. and Army Mechanics and Materials Lab., Watertown, Mass.
Availability: Pub. in Macromolecules Sci. Phys., vB8 n1/2 p29-40 1973.

Descriptors: *Polyethylene, *Dielectric properties, Light scattering, X ray diffraction, Birefringence, Mechanical properties, Molecular structure, Orientation(Direction).
Identifiers: Dichroism.

The alpha mechanical loss region of low-density polyethylene has been studied by vibrational and relaxational X-ray diffraction, birefringence, IR dichroism, light-scattering, and dielectric methods. These experiments are consistent with the proposal of Takayanagi that the (alpha sub 1) process is intercrystalline in nature and exhibits an activation energy of about 25 kcal/mole, where the (alpha sub 2) loss is intracrystalline and posseses an activation energy of about 50 kcal/mole. (Author)

AD-786 082/8GA Reprint
Massachusetts Univ Amherst Polymer Research Inst
STUDIES OF SOLID POLYMERS WITH LIGHT,
Richard S. Stein. 1973, 8p AROD-10645.7-C
Grant DA-ARO-D-31-124-72-G161
Sponsored in part by National Science Foundation, Washington, D.C.
Availability: Pub. in the Jnl. of Chemical Education, v50 n11 p748-753 Nov 73.

Descriptors: *Polymers, *Light scattering, *Molecular structure, Birefringence, Polarization, Optical properties, Anisotropy, Refractive index, Orientation(Direction).
Identifiers: Dichroism.

Polymers interact uniquely with light in such a way as to illustrate the directional nature of refraction, absorption, and scattering. The strong effects of polarization demonstrate that electronic motion in molecules is anisotropic and may be used to learn about molecular shape, orientation, and size. The ability of these techniques to follow rapid changes gives rise to the science of 'rheo-optics,' the study of flow by optical techniques.

ARH-SA-195 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
TEN YEARS WITH PLASTICS IN NUCLEAR PROCESSING.
L. E. Bruns. Aug 74, 15p CONF-740804-1
Contract AT(45-1)-2130

Descriptors: (*Teflon, *Uses), (*Organic fluorine compounds, Uses), (*Polymers, Uses), (*Fuel reprocessing plants, *Containers), Building materials, Corrosion resistance, Efficiency, Hapo, Pipes, Safety, Stability.

For abstract, see NSA 30 08, number 21833.

BDX-613-1033 PC$5.75/MF$2.25
Bendix Corp., Kansas City, Mo.
DESIGN MANUAL FOR POLYSTYRENE FOAM, RELATING PHYSICAL, MECHANICAL, AND CHEMICAL PROPERTIES.
D. J. Fossey. Feb 74, 54p
Contract AT(29-1)-613

Descriptors: (*Polystyrene, *Mechanical properties), Chemical properties, Design, Fabrication, Foams, Manuals, Physical properties, Tables.

For abstract, see NSA 30 08, number 23398.

BDX-613-1110 PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.
POLYURETHANE/IMIDE MODIFIED FOAM.
J. Salary. Aug 74, 33p
Contract AT(29-1)-613

Descriptors: (*Polyurethanes, *Production), (*Imides, Production), (*Cyanates, *Chemical reactions), (*Carboxylic acids, Chemical reactions), Carbon dioxide, Decomposition, Foams, High temperature, Medium temperature, Polymers, Sample preparation.

For abstract, see NSA 30 08, number 23399.

BDX-613-1137(Rev.) PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.

EFFECTS OF VARYING FORMULATIONS OF THREE TDI POLYURETHANE FOAMS.
R. F. Taylor, and S. L. DeGisi. Aug 74, 33p
Contract AT(29-1)-613

Descriptors: (*Polyurethanes, *Production), Chemical reactions, Compression strength, Density, Foams, Materials working, Molding, Size, Standards, Variations.

For abstract, see NSA 30 08, number 23401.

BDX-613-195(Rev.) PC$8.75/MF$2.25
Bendix Corp., Kansas City, Mo.
RIGID EPOXY FOAM ENCAPSULATION. FINAL REPORT.
F. C. Ayres. Jun 74, 112p
Contract AT(29-1)-613

Descriptors: (*Epoxides, *Fabrication), (*Foams, Fabrication), Decomposition, Electrical properties, Electronic circuits, Electronic equipment, Environmental effects, Mechanical properties, Performance testing, Protective coatings, Surface coating, Thermodynamic properties.

For abstract, see NSA 30 08, number 23397.

11K. Solvents, Cleaners, and Abrasives

PAT-APPL-431 762 PC$3.25/MF$2.25
Department of Agriculture, Washington, D.C.
METHOD FOR REDUCING HEATING AND BRIGHTNESS LOSS IN PULP CHIPS WITH AQUEOUS SOLUTIONS OF SODIUM N-METHYLDITHIOCARBAMATE.
Patent Application,
Edward L. Springer. Filed 8 Jan 74, 8p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Thiocarbamates, *Wood preservatives, *Bactericides, Heating, Wood wastes, Spraying, Biodegradation, Brightness, Dipping.
Identifiers: Carbamic acid/dithio-N-methyl-(sodium-salt), PAT-CL-424-162, *Wood chips, Wood piles.

The patent application describes a treatment to retard brightness losses in wood chips during stockpiling. The treatment involves a spraying or dipping of the chips with a dilute aqueous solution of sodium N-methyldithiocarbamate. The chemical treatment effectively prevents initial chip pile heating and greatly reduces the loss of wood brightness during such storage.

11L. Wood and Paper Products

PB-235 764/8GA PC$4.25/MF$2.25
Western Forest Products Lab., Vancouver (British Columbia).
COMBINED SPECIES-TEMPERATURE CORRECTION TAPES FOR MOISTURE METERS. REVISED,
G. Bramhall, and M. Salamon. Mar 74, 61p VP-X-103-Rev
Supercedes December 1972 edition, PB-215 353.

Descriptors: *Moisture meters, *Wood, Tables(Data), Corrections, Softwoods, Hardwoods, Moisture content, Temperature, Canada.

Twenty-one tables provide direct conversion of power-loss and resistance-type moisture meter readings to moisture content; corrections having been made for both temperature 0 to 200F, for power-loss meters, and -40 to 240F, for resistance meters, and for species (seven softwoods for power-loss meters, 13 softwoods and one hardwood for resistance meters).

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-785 599/2GA PC$10.25/MF$2.25
George Washington Univ Washington D C Dept of Statistics
THE INFORMATION IN CONTINGENCY TABLES.
Final technical rept.,
Solomon Kullback. Sep 74, 385p Rept no. K-1-74
AROD-12226.2-M
Grant DAHC04-74-G-0164

Descriptors: *Sampling, *Statistical data, *Classification, Discriminate analysis, Estimates, Biometry, Matrices(Mathematics), Computations, Computer programming.
Identifiers: *Contingency tables, Outliers.

Data which result from experiments in the physical sciences and engineering are usually outcomes of controlled experiments, and expressible in quantitative terms. In many other fields however, the data are seldom results of controlled experiments. In addition, the observations usually can be expressed only in qualitative or categorical terms. If observations are taken over a sample of many such individuals, the result will be a multidimensional contingency table with as many dimensions as there are classifications. Contingency tables are cross-classifications of vectors of discrete random variables showing the number of subjects belonging to distinct categories of each of several qualitative or categorical classifications.

AD-785 623/0GA PC$3.25/MF$2.25
Army Research Office Durham N C
ON THE ARITHMETIC MEANS AND VARIANCES OF PRODUCTS AND RATIOS OF RANDOM VARIABLES,
Fred Frishman. 1971, 16p

Descriptors: *Analysis of variance, Random variables, Mean, Distribution functions.

AD-785 785/7GA Reprint
Maryland Univ College Park Inst for Fluid Dynamics and Applied Mathematics
ERROR BOUNDS FOR STATIONARY PHASE APPROXIMATIONS,
F. W. J. Olver. 10 Nov 72, 13p AROD-11374.1-M
Grants DA-ARO-D-31-124-71-G133, NSF-GP-20529
Prepared in cooperation with National Bureau of Standards, Washington, D.C. Revision of report dated 4 Aug 74.
Availability: Pub. in SIAM Jnl. of Mathematical Analysis, v5 n1 p19-29 Feb 74.

Descriptors: *Integral equations, *Complex variables, Analytic functions, Theorems.

AD-785 794/9GA Reprint
Utah Univ Salt Lake City Dept of Mathematics
A NOTE ON PERIODIC SOLUTIONS FOR DELAY-DIFFERENTIAL SYSTEMS,
G. B. Gustafson, and K. Schmitt. 12 Feb 73, 8p
AROD-9157.8-M
Grant DA-ARO-D-31-124-72-G56
Availability: Pub. in Proceedings of the American Mathematical Society, v42 n1 p161-166.

Descriptors: *Differential equations, Periodic functions, Functional analysis, Theorems.

AD-785 798/0GA Reprint
Brown Univ Providence R I Div of Applied Mathematics
COINCIDENCE DEGREE AND PERIODIC SOLUTIONS OF NEUTRAL EQUATIONS,
Jack K. Hale, and J. Mawhin. 18 Apr 73, 15p
AROD-5145.90-M
Grants DA-ARO-D-31-124-71-G12, AF-AFOSR-2078-71
Sponsored in part by Grant NGL-40-002-015.
Availability: Pub. in Jnl. of Differential Equations, v15 n2 p295-307 Mar 74.

Descriptors: *Differential equations, *Functional analysis, Periodic functions, Theorems.

This paper is deveoted to the problem of existence of periodic solutions for some nonautonomous neutral functional differential equations. It is essentially an application of a basic theorem on the Fredholm alternative for periodic solutions of some linear neutral equations recently obtained by one of the authors and of a generalized Leray-Schauder theory developed by the second one.

AD-785 809/5GA Reprint
California Univ Berkeley Statistical Lab
A NEW GENERAL ESTIMATE OF THE RATE OF CONVERGENCE IN THE CENTRAL LIMIT THEOREM IN R^k,
V. V. Sazonov. 30 Aug 73, 6p AROD-10913.3-M
Grant DA-ARO-D-31-124-73-G31
Availability: Pub. in Proceedings of the National Academy of Sciences of the United States of America, v71 n1 p118-121 Jan 74.

Descriptors: *Probability, *Estimates, Convex sets, Measure theory, Convergence, Theorems.
Identifiers: *Central limit theorem.

A general theorem is proved which gives an estimate of the rate of convergence on convex sets in the multidimensional central limit theorem for identically distributed summands. The estimate depends on the distance of the boundary of the convex set from the origin (the larger the distance, the better the estimate). The estimate makes sense under minimal requirements on the moments. Furthermore, the dependence on the distribution of a summand in it is in terms of pseudo-moment type quantities which may be small even if the moments are large. (Author)

AD-785 815/2GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
FORMATION OF SINGULARITIES IN ONE-DIMENSIONAL NONLINEAR WAVE PROPAGATION,
Fritz John. Feb 74, 30p
Contract N00014-67-A-0467-0030
Availability: Pub. in Communications on Pure and Applied Mathematics, v27 p377-405 1974.

Descriptors: *Shock waves, *Differential equations, Matrices(Mathematics), Equations of motion, Elastic waves.
Identifiers: Riemannian manifolds.

AD-785 817/8GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
ON A SUFFICIENTLY FINE MESH FOR QUASILINEAR ELLIPTIC EQUATIONS,
M. S. Mock. 1974, 11p
Grant AF-AFOSR-2499-73
Availability: Pub. in Communications on Pure and Applied Mathematics, v27 p351-360 1974.

Descriptors: *Partial differential equations, *Nonlinear differential equations, Numerical analysis, Approximation, Theorems.
Identifiers: *Elliptic differential equations.

The numerical solution of nonlinear partial differential equations is typically motivated by a physical interpretation of the problem considered, and the approximate computed solutions are typically used to identify and assess the importance of physical mechanisms associated with various terms in the mathematical model. The question of how fine a mesh is needed to obtain accurate physical conclusions by this method is settled in general by empirical methods, with varying degrees of success. In this paper we consider this question in the case of a class of elliptic equations,

composed of a leading linear term and a nonlinear term of lower order.

AD-785 818/6GA Reprint
Louisiana State Univ Baton Rouge Dept of Chemical and Electrical Engineering
A NEW CLASS OF DECENTRALIZED FILTERS FOR INTERCONNECTED SYSTEMS.
Interim rept.,
C. W. Sanders, E. C. Tacker, and T. D. Linton. 19 Nov 73, 6p AFOSR-TR-74-1494
Contract F44620-68-C-0021
Availability: Pub. in Jnl. of IEEE Transactions on Automatic Control, p259-262 Jun 74.

Descriptors: *Control theory, Kalman filtering, Information theory.

A filter is derived for interconnected dynamical systems in which the information pattern is decentralized. Qualitative aspects of the filter's performance are given in terms of an observability condition, and quantitative performance data are generated for the case of state estimation in a two-area power system. (Author)

AD-785 823/6GA PC$3.75/MF$2.25
Stanford Univ Calif Dept of Statistics
THE INTERACTION BETWEEN LARGE SAMPLE THEORY AND OPTIMAL DESIGN OF EXPERIMENTS.
Technical rept.,
Herman Chernoff. 29 Jul 74, 26p Rept no. TR-84
Contract N00014-67-A-0112-0078

Descriptors: *Sampling, *Experimental design, Distribution functions, Estimates, Hypotheses.

Large sample considerations simplify analysis and distributional theory, provide clarity and make possible meaningful concepts of optimality, relative efficiency and informaton. These concepts in turn provide the basis for the definition and derivation of optimal designs of experiments. (Author)

AD-785 826/9GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Statistics
A NOTE ON OPTIMAL STOPPING FOR PARTIAL SUMS.
Technical rept.,
Ashim Mallik. 1 Aug 74, 9p Rept no. TR-86
Contract N00014-67-A-0112-0078
Prepared in cooperation with Pittsburgh Univ., Pa.

Descriptors: *Statistical analysis, Brownian motion, Theorems.
Identifiers: Stopping rules.

AD-785 827/7GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Statistics
SEQUENTIAL ESTIMATION OF THE MEAN OF A NEGATIVE BINOMIAL DISTRIBUTION.
Technical rept.,
Michael Binns. 31 Jul 74, 25p Rept no. TR-85
Contract N00014-67-A-0112-0078
Prepared in cooperation with Department of Agriculture, Ottawa (Ontario).

Descriptors: *Sampling, *Distribution functions, *Sequential analysis, Estimates, Monte Carlo method, Theorems, Mean.
Identifiers: Binomial distribution.

A sequential procedure is proposed to estimate the mean of a negative binomial distribution when the value of the exponent (k) is known. An approximation is obtained for the distribution of the estimate from which it may be shown that the precision amounts to having a predetermined coefficient of variation. The effect of imperfect information on k is investigated. Comparisons are made with other procedures including the variance-stabilizing logarithmic transformation. (Author)

AD-785 828/5GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Statistics
SEQUENTIAL ESTIMATION OF MEAN OF A NORMAL DISTRIBUTION.
Technical rept.,
Ashim Mallik. 15 Aug 74, 16p Rept no. TR-87
Contract N00014-67-A-0112-0078

Descriptors: *Sequential analysis, *Normal density functions, Sampling, Estimates, Approximation, Mean.
Identifiers: Wiener processes.

AD-785 849/1GA PC$3.25/MF$2.25
Kentucky Univ Lexington Dept of Statistics
THE SECRETARY PROBLEM WITH INTERVIEW COST,
R. Bartoszynski, and Z. Govindarajulu. Jul 74, 25p Rept nos. TR-71, TR6-ONR
Contract N00014-73-A-0385-0001

Descriptors: *Decision theory, Probability, Costs, Permutations.
Identifiers: *Stopping rules(Mathematics), *Secretary problem, Ranking.

The paper deals with the so-called secretary problem, i.e. with the problem of optimal stopping of the random permutation (x sub 1),...,x sub n of numbers 1,...,n, when the admissible information at each stage is only the relative value of the element observed last with respect to the preceding ones. (Modified author abstract)

AD-785 864/0GA PC$3.25/MF$2.25
Case Western Reserve Univ Cleveland Ohio Dept of Mathematics and Statistics
A SEQUENTIAL DETECTION PROCEDURE.
Technical rept. no. 17,
Rasul A. Khan. 15 Aug 74, 17p Rept no. TR-17
Contract N00014-67-A-0404-0009

Descriptors: *Sequential analysis, Bayes theorem, Probability density functions, Detection, Theorems.
Identifiers: Stopping rules(Mathematics).

Using the ideas of sequential distinguishability a sequential probability ratio type procedure is studied for the quick detection problem. The procedure is such that it controls the probability of false alarm. The proposed rule is examined in detail for its performance.

AD-785 865/7GA PC$3.25/MF$2.25
Case Western Reserve Univ Cleveland Ohio Dept of Mathematics and Statistics
ESTIMATION OF AN INTEGER-VALUED LOCATION PARAMETER.
Technical rept.,
Rasul A. Khan. 15 Jun 74, 16p Rept no. TR-18
Contract N00014-67-A-0404-0009

Descriptors: *Statistical analysis, *Estimates, Probability density functions, Random variables, Theorems.
Identifiers: Parameter estimation, Maximum likelihood estimation.

Let X1,X2,...,Xn be i.i.d N(i,1) random variables, and set d = (Xn), the nearest integer to the sample mean. Under the squared error loss it is shown that d is minimax and admissible in the class of integer-valued estimators. The problem of estimating in integer-valued location parameter is also considered. Under mild conditions, the maximum likelihood estimator is minimax and admissible with respect to zero-one loss.

AD-785 878/0GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center, Charlottesville, Va.
THE INVERSE LAPLACE TRANSFORM FOR FUNCTIONS WHICH CAN BE EXPANDED IN GENERALIZED POWER SERIES,
V. I. Kalvasser, and V. I. Kirshbaum. 25 Jul 74, 6p FSTC-HT-23-178-73
Trans. of mono. Sbornik Trudov po Fiziko-Matematicheskim Naukam, Kuybyshev, 1970 p74-76.

Descriptors: *Integral transforms, *Power series, Complex variables, Translations, USSR.
Identifiers: *Laplace transformation.

AD-785 897/0GA PC$3.25/MF$2.25
Arizona Univ Tucson Dept of Mathematics
THE SINGULAR PERTURBATION APPROACH TO SINGULAR ARCS.
Technical rept.,
Robert E. O'Malley, Jr. 1 Sep 74, 25p Rept no. TR-5
Contract N00014-67-A-0209-0022
Presented at the International Congress on Differential Equations, Los Angeles, Calif., Sep 74.

Descriptors: *Control theory, Perturbation theory, Differential equations, Matrices(Mathematics), Calculus of variations, Optimization, Asymptotic series.

AD-785 924/2GA Reprint
Illinois Univ Urbana Coordinated Science Lab
SENSITIVITY OF LINEAR TIME INVARIANT SAMPLED DATA SYSTEMS TO SAMPLING PERIOD,
R. K. Varshney, and William R. Perkins. 31 Oct 73, 5p AFOSR-TR-74-1493
Contract DAAB07-72-C-0259, Grant AF-AFOSR-1579-68
Revision of report dated 4 Jun 73. Summary in French, German and Russian.
Availability: Pub. in Automatica, v10 p317-319 1974.

Descriptors: *Control theory, *Linear systems, Sampling, Theorems.
Identifiers: Sensitivity analysis, Time invariant systems.

A technique for generation of sampling-period sensitivity functions for cyclic linear time-invariant sampled data systems is presented. The method uses some results of Rozenvasser to form the sensitivity models. The sensitivity functions are discontinuous at sampling times. Using some aspects of controllability, it is shown that integration of the model equations over one period only is sufficient to generate the sensitivity functions for all additional periods. (Author)

AD-785 944/0GA PC$3.75/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
ON THE EXACT DISTRIBUTION OF THE TRACE OF A COMPLEX MULTIVARIATE BETA MATRIX.
Technical interim rept.,
P. R. Krishnaiah, and F. J. Schuurmann. Jul 74, 34p Rept no. ARL-TR-74-0107
Contract F33615-71-C-1463

Descriptors: *Multivariate analysis, *Distribution functions, Matrices(Mathematics), Tables(Data), Vibration, Jet transport planes.
Identifiers: C-5A aircraft, C-5 aircraft.

An expression was given by Krishnaiah for the density of the distribution of the trace of a complex multivariate beta matrix. Using this expression, the authors have computed exact upper 1%, 2.5%, 5%, 10%, 25%, and 50% points of the distribution of the above trace. The applications of this distribution in the area of the inference on multiple time series are also discussed. Finally, the usefulness of these tables is illustrated by analyzing some data on a C-5A aircraft. (Author)

AD-785 958/0GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif
POSITION ESTIMATION FOR A SCAN SYSTEM VIA NONLINEAR FILTERING. PART

I: STATIONARY TARGET IN WHITE GAUSSIAN NOISE,
K. K. Wong. 1 Jul 74, 44p Rept no. TR-0075(5901-03)-2 SAMSO-TR-74-219
Contract F04701-74-C-0075

Descriptors: *Signal processing, *Kalman filtering, Scanning, White noise, Signal to noise ratio, Estimates, Recursive functions, Algorithms, Bayes theorem.
Identifiers: *Nonlinear filtering, Bayesian estimation.

Bayes' estimation technique has been applied to the processing of the intensity data from the output of a scanning sensor. A simple recursive algorithm is realized for the position estimation of a stationary target. (Author)

AD-786 006/7GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIENCE IN THE USE OF COLLECTIVE EXPERT EVALUATION OF THE PROSPECTS FOR TECHNICAL BRANCH DEVELOPMENT,
L. Smirnov, Yu. Ershov, and E. Bryatskii. 29 Aug 74, 16p Rept no. FTD-HC-23-2358-74
Edited trans. of mono. from Sovet Ekonomicheskoi Vzimopomoshchi. Postoyannaya Komissiya po Koordinatsii Nauchnykh i Tekhnicheskikh Issledovanii Teoriya i Praktika Prognozirovaniya Razvitiya Nauki i Tekhniki v Stranakh-Chlenakh Sev, n.p., 1971 p243-251.

Descriptors: *Scientific research, Statistical analysis.
Identifiers: Evaluation, Ranking.

AD-786 081/0GA Reprint
Brown Univ Providence R I Div of Applied Mathematics
STRUCTURE OF SOLUTIONS OF THE RIEMANN PROBLEM FOR HYPERBOLIC SYSTEMS OF CONSERVATION LAWS,
Constantine M. Dafermos. 2 Nov 73, 17p AROD-5145.96-M
Contract N00014-67-A-0191-0009, Grant DA-ARO-D-31-124-71-G12
Sponsored in part by National Science Foundation, Washington, D.C., Grant NSF-GP-28931.
Availability: Pub. in Archive for Rational Mechanics and Analysis, v53 n3 p203-217 1974.

Descriptors: *Shock waves, *Wave equations, Differential equations, Entropy, Theorems.
Identifiers: Hyperbolic differential equations, Riemann functions.

AD-786 088/5GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
ASYMPTOTIC STABILITY IN SINGULAR PERTURBATION PROBLEMS. II. PROBLEMS HAVING MATCHED ASYMPTOTIC EXPANSION SOLUTIONS,
Frank Hoppensteadt. 15 Feb 73, 14p AROD-5669.30-M
Grant DA-ARO-D-31-124-72-G47
Availability: Pub. in Jnl. of Differential Equations, v15 n3 p510-521 May 74.

Descriptors: *Differential equations, Perturbation theory, Asymptotic series, Theorems.
Identifiers: Asymptotic stability.

The stability of systems of ordinary differential equations of the form dx/dt = f(t,x,y,epsilon), epsilon dy/dt = g(t,x,y,epsilon), where epsilon is a real parameter near zero, is studied. It is shown that if the reduced problem dx/dt = f(t,s,y,O), O = g(t,x,y,O), is stable, and certain other conditions which ensure that the method of matched asymptotic expansions can be used to construct solutions are satisfied, then the full problem is asymptotically stable as t nears infinity, and a domain of stability is determined which is independent of epsilon. (Modified author abstract)

AD-786 094/3GA Reprint
Brown Univ Providence R I Div of Applied Mathematics
BIFURCATION AND STABILITY FOR A NON-LINEAR PARABOLIC PARTIAL DIFFERENTIAL EQUATION,
Nathaniel Chafee, and E. F. Infante. 29 Mar 73, 6p AROD-5145.88-M
Grants DA-ARO-D-31-124-71-G12, NGL-40-002-015
Availability: Pub. in Bulletin of the American Mathematical Society, v80 n1 p49-52 Jan 74.

Descriptors: *Partial differential equations, *Nonlinear differential equations, Numerical analysis, Theorems.
Identifiers: *Bifurcation theory, *Parabolic differential equations.

AD-786 100/8GA Reprint
North Carolina Univ Chapel Hill Dept of Statistics
EXTENSIONS AND CORRECTIONS TO 'TABLES TO FACILITATE FITTING S SUB U FREQUENCY CURVES',
N. L. Johnson. Aug 73, 5p AROD-9778.10-M
Contract DAHC04-71-C-0042
Availability: Pub. in Biometrika, v61 n1 p203-205 1974.

Descriptors: *Statistical analysis, Tables(Data).

Recalculation and extension of original tables for fitting (S sub U) curves (Johnson, 1965) brought to light errors in original values of the location parameter - gamma. Corrections for these values are presented.

AD-786 115/6GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE QUESTION OF CRITERIA IN THE FORECASTING OF RESEARCH AND OF EXPERIMENTAL-DESIGN WORK EFFICIENCY,
A. Anisimov, and G. Zarubin. 12 Sep 74, 13p Rept no. FTD-HC-23-2355-74
Edited trans. of mono. from Sovet Ekonomicheskoi Vzaimpponoshchi. Postoyannaya Komissiya po Koordinatsii Nauchnykh i Tekhnicheskikh Issledovanii. Teoriya i Praktika Prognozirovaniya Rasvitiya Nauki i Tekhniki v Stranakh-Chlenakh Sev, n.p., 1971 p223-229.

Descriptors: *Experimental design, Forecasting, Matrices(Mathematics), Translations, USSR.

AD-786 130/5GA Reprint
California Univ Los Angeles
UNIFORM DENSITIES ON HYPERBOLIC RIEMANN SURFACES,
Mitsuru Nakai. 23 Oct 72, 26p AROD-9653.46-M
Grant DA-ARO-D-31-124-71-G20
Availability: Pub. in Nagoya Math. Jnl., v51 p1-24 1973.

Descriptors: *Potential theory, *Complex variables, Green's function, Theorems.
Identifiers: *Riemann surfaces, Dirichlet integral.

The author is interested in the question how the spaces of solutions of elliptic equations vary according to the variations of underlying regions and coefficients of the equation. We will discuss this question for the case of equations deltau = Pu considered on noncompact Riemann surfaces R.

AD-786 226/1GA PC$3.25/MF$2.25
Texas Univ Austin Center for Numerical Analysis
ASYMPTOTIC ERROR EXPANSIONS FOR SPLINE INTERPOLATION: SOME REMARKS,
James W. Daniel. Aug 74, 20p Rept no. CNA-87
Contract N00014-67-A-0125-0015

Descriptors: *Splines, *Interpolation, Asymptotic series, Polynomials, Computations, Theorems, Errors.
Identifiers: *Spline interpolation.

Asymptotic error expansions of the form (s sub h)(x) = f(x) + the summation from i=p to q (h sup i)(g sub i)(x) + O(h sup(q+1)) are derived for some particular schemes for determining splines s interpolating data of a given function f. Both local and global interpolation methods are considered; generally applicable, techniques are exemplified with cubic and quadratic splines for which the precise error expansions are developed. (Author)

AD-786 227/9GA PC$3.25/MF$2.25
Texas Univ Austin Center for Numerical Analysis
OFF-KNOT SPLINE INTERPOLATION AND CONSTRAINED APPROXIMATION: SOME NEGATIVE RESULTS,
James W. Daniel. Aug 74, 22p Rept no. CNA-88
Contract N00014-67-A-0126-0015

Descriptors: *Splines, *Interpolation, *Approximation, Polynomials, Theorems, Convex sets.
Identifiers: *Spline interpolation, Galerkin method, *Spline approximation.

Quadratic splines are generated which interpolate a function and its derivative at points midway between alternate pairs of knots, and the error bound is shown to be precisely of order (h sup 2) rather than (h sup 3) as expected. This result is related to best constrained approximation by splines and thence to Galerkin methods for constrained problems. (Author)

AD-786 228/7GA PC$3.75/MF$2.25
Texas Univ Austin Center for Numerical Analysis
EXTRAPOLATION WITH SPLINE-COLLOCATION METHODS FOR TWO-POINT BOUNDARY VALUE PROBLEMS. I. JUSTIFICATION AND PROPOSALS,
James W. Daniel. Aug 74, 34p Rept no. CNA-89
Contract N00014-67-A-1026-0015

Descriptors: *Splines, *Finite difference theory, *Boundary value problem, Extrapolation, Interpolation, Algorithms, Asymptotic series.
Identifiers: Spline interpolation, Two point boundary value problems, Collocation method.

Asymptotic expansions for the error in some spline interpolation schemes are used to derive asymptotic expansions for the truncation errors in some spline collocation methods for two-point boundary-value problems. This raises the possibility of using Richardson extrapolation or iterated deferred corrections to develop efficient high-order algorithms based on low-order collocation in analogy with similar codes based on low-order finite difference methods; some specific such procedures are proposed. (Author)

AD-786 274/1GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ON THE H-MATRIX SYSTEM REPRESENTATION.
Journal article,
David R. Audley, and Wilson J. Rugh. 25 Sep 72, 10p Rept no. ARL-74-0093
Revision of report dated 17 Jun 72.
Availability: Pub. IEEE Transactions on Automatic Control, vAC-18 n3 p235-242 Jun 73.

Descriptors: *Control theory, Linear systems, Matrices(Mathematics), Transfer functions.
Identifiers: Hankel matrices.

The H-matrix representation of the input/output behavior of an asymptotically stable constant parameter linear system is discussed. The concept of a canonical representation and the measurements required to determine this representation directly are treated. The minimal complete realization problem is solved for the H-matrix representation based on exponential signals, and connections between this approach and the identification and realization theories based on the Hankel matrix of Markov parameters are exhibited. (Author)

COM-74-50837/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
DESIGN AND ANALYSIS OF EXPERIMENTS.
Final rept.,
Mary G. Natrella. 1974, 49p
Pub. in Quality Control Handbook, ed3, sect27 p27-1--27-49 1974.

Descriptors: *Experimental design, Block design, Latin squares, Factor analysis.

This chapter provides an introduction to the design and analysis of experiments, including a classification of designs and a summary of important recent developments. Detailed designs and methods of analysis are given for factorial and fractional factorial designs, for completely randomized designs, and for the more common types of block designs (e.g. randomized blocks, balanced incomplete blocks, Latin Squares). Descriptions are given of some special-purpose designs, such as mixture designs, group screening designs and cross-over designs. Some simple techniques that are useful in planning and analyzing the results of interlaboratory tests are included.

IS-T-648 PC$6.25/MF$2.25
Ames Lab., Iowa.
ITERATIVE METHOD FOR THE SOLUTION OF THE ALGEBRAIC EIGENVALUE PROBLEM FOR HERMITIAN MATRICES.
R. S. Conker. Jul 74, 63p
Contract W-7405-eng-82

Descriptors: (*Hermitian matrix, *Numerical solution), Algebra, Eigenvalues, Iterative methods, Programming, Vectors.

For abstract, see NSA 30 08, number 23302.

ITF-74-8P PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
HOROSPHERIC TRANSFORMATIONS AND HARMONIC ANALYSIS ON ONE-SHEETED HYPERBOLOID. I.
P. I. Golod. 1974, 25p
In Russian. U.S. Sales Only.

Descriptors: Geometry, Mathematics, Series expansion, Spheres.

For abstract, see NSA 30 08, number 23303.

KAPL-M-7339 PC$8.75/MF$2.25
Knolls Atomic Power Lab., Schenectady, N.Y.
RADI GEOMETRY MODULES.
R. H. Jr. Beam, and H. J. Kopp. Jun 74, 111p
Contract W-31-109-eng-52

Descriptors: (*Geometry, *Two-dimensional calculations), Comparative evaluations, Computer calculations, Computer codes, Interfaces, Manuals, Operation, Programming, Standards.

For abstract, see NSA 30 08, number 23307.

KFKI-74-41 PC$7.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
UNIVERSAL ALGEBRAIC CONSTRUCTION OF LOGICS.
H. Andreka, I. Nemeti, and T. Gergely. 1974, 76p
U.S. Sales Only.

Descriptors: Algebra, Diagrams, Mathematics, Numerical solution.

For abstract, see NSA 30 08, number 23316.

N74-29509/8GA PC$11.00/MF$2.25
Technische Hogeschool, Delft (Netherlands).
ESTIMATION OF PARAMETERS OF LINEAR SYSTEMS USING PERIODIC TEST SIGNALS.
A. Vandenbos. 1974, 157p

Descriptors: *Electromagnetic noise, *Least squares method, *Linear systems, Differential equations, Fourier analysis, Numerical analysis.

For abstract, see STAR 1219

N74-29600/5GA PC$10.75/MF$2.25
Technische Universitaet, Brunswick (West Germany).
THE SELECTION OF DISCRETE CONTROLS IN THE PRESENCE OF STOCHASTIC DISTURBANCES ZUR WAHL DISKRETER REGLERBEI ANWESENHEIT STOCHASTISCHER STOERUNGEN.
Ph.D. Thesis.
H. Hammer. 1973, 151p
Language in German.

Descriptors: *Digital techniques, *Optimal control, *Random noise, *Stochastic processes, Compensation, Control theory, Production engineering, Transmission loss.

For abstract, see STAR 1219

N74-29602/1GA PC$10.00/MF$2.25
Technische Hochschule, Hanover (West Germany).
A CONTRIBUTION TO THE STABILITY AND TRANSFER BEHAVIOR ON NONLINEAR CONTROL SYSTEMS WITH TWO VARIABLES EIN BEITRAG ZUM STABILITAETS- UND UEBERTRAGUNGSVERHALTEN NICHTLINEARER ZWEIGROESSENREGELKREISE.
Ph.D. Thesis.
G. Wohlschlegal. 1972, 136p
Language in German.

Descriptors: *Bivariate analysis, *Control stability, *Nonlinear systems, Feedback control, Liapunov functions, Matrices (Mathematics).

For abstract, see STAR 1219

N74-30021/1GA PC$5.50/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ON THE AUTO AND CROSS CORRELATION OF PN SEQUENCES.
J. C. Moralis. Dec 69, 48p NASA-TM-X-70699, X-520-69-527

Descriptors: *Autocorrelation, *Cross correlation, *Pseudorandom sequences, Algorithms, Coding, Linearization, Multiplexing, Random variables, Shift registers.

For abstract, see STAR 1219

N74-30023/7GA PC$6.25/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
INTERSECTION POINT PROPERTIES OF LEVEL LINE FAMILIES SCHNITTPUNKTEIGENSCHAFTEN EBENER GERADEN FAMILIEN.
Ph.D. Thesis.
V. Douglas. 1973, 62p
Language in German.

Descriptors: *Curves (Geometry), *Fixed points (Mathematics), *Lines (Geometry), Coordinates, Differential geometry, Manifolds, Vector spaces.

For abstract, see STAR 1219

N74-30026/0GA PC$10.25/MF$2.25
Toulouse Univ. (France).
DYNAMIC OPTIMIZATION FOR QUASILINEARIZATION AND HIERARCHY COMMAND OPTIMISATION DYNAMIQUE PAR QUASILINEARISATION ET COMMANDE HIERARCHISEE.
Ph.D. Thesis.
J. Galy. 1973, 141p
Language in French.

Descriptors: *Hierarchies, *Mathematical models, *Nonlinear systems, *Optimal control, Boundary value problems, Systems analysis.

For abstract, see STAR 1219

N74-30027/8GA PC$8.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Decision and Control Sciences Group.
OPTIMAL COMPENSATOR STRUCTURE FOR LINEAR TIME-INVARIANT PLANT WITH INACCESSIBLE STATES.
M.S. Thesis.
P. J. P. Blanvillain. May 74, 115p NASA-CR-138304, ESL-R-546
Contracts NGL-22-009-124, MIT OSP PROJ. 76265

Descriptors: *Linear systems, *Optimal control, Canonical forms, Compensators, Feedback control, Matrices (Mathematics), Riccati equation.

For abstract, see STAR 1219

N74-31036/8GA PC$5.50/MF$2.25
Ruhr Univ., Bochum (West Germany).
COMBINATION OF SINGLE STEP- AND RELAXATION-METHOD KOMBINATION VON EINZELSCHRITT- UND RELAXATIONSVERFAHREN.
Ph.D. Thesis.
J. Schade. 1973, 48p
Language in German.

Descriptors: *Iterative solution, *Linear equations, *Matrices (Mathematics), Convergence, Optimization, Relaxation method (Mathematics), Step functions.

For abstract, see STAR 1220

N74-31037/6GA PC$8.00/MF$2.25
Technische Hochschule, Hanover (West Germany).
A CONTRIBUTION TO THE THEORY OF OPTIMAL CONTROL SYSTEM STRUCTURES, PROPERTIES AND SYNTHESES IN THE FREQUENCY REGION EIN BEITRAG ZUR THEORIE DES STRUKTUROPTIMALEN REGELUNGSSYSTEMS, EIGENSCHAFTEN UND SYNTHESE IM FREQUENZBEREICH.
Ph.D. Thesis.
K. Heym. 1972, 97p
Language in German.

Descriptors: *Algorithms, *Matrices (Mathematics), *Optimal control, Control theory, Inversions, Linear systems, Variable.

For abstract, see STAR 1220

N74-31039/2GA PC$5.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
DIGITAL SIMULATION OF RANDOM PERTURBATION VARIABLES.
M. Zindel. Jul 74, 46p NASA-TT-F-15795, DLR-MITT-70-12
Contract NASW-2483
Tran-Transl. Into English from German Report Dlr-Mitt-70-12. Conf-Presented at the Meeting of the Dglr Sci. Comm. On Flight Performance and Flight Characteristics, Darmstadt, 12-13 Nov. 1970.

Descriptors: *Digital simulation, *Perturbation, *Random variables, Computerized simulation, Statistical analysis, Vectors (Mathematics).

For abstract, see STAR 1220

N74-31040/0GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
NECESSARY AND SUFFICIENT CONDITIONS OF ABSOLUTE ASYMPTOTIC STABILITY OF

LINEAR SYSTEMS OF DIFFERENTIAL EQUATIONS WITH CONSTANT DELAY.
B. Koval, and Y. Tsarkov. Jul 74, 8p NASA-TT-F-15830
Contract NASW-2481
Tran-Transl. Into English from Dopovid. Akad. Nauk Ukr. Rsr, Ser. A. Fizikotekhn. Mat. Navukovi (Kiev), V. 34, Jun. 1972 p 506-509.

Descriptors: *Asymptotes, *Differential equations, *Linear systems, Linear equations, Matrices (Mathematics), Time constant, Time lag.

For abstract, see STAR 1220

N74-31041/8GA PC$5.00/MF$2.25
Elektronikcentralen, Hoersholm (Denmark). Danish Research Centre for Applied Electronics.
FRAES: DESCRIPTION OF ADVANCED ALGORITHMS FOR TRACING, CONTROL, AND INTERPOLATION BESKRIVELSE AF AVANCEREDE ALGORITMER FOR UDJAEVNING, STYRING OG INTERPOLATION.
J. Wested. Mar 74, 40p ECR-39
In Danish; English Summary.

Descriptors: *Algorithms, *Automatic control, *Computer programming, *Curves (Geometry), Control simulation, Machine tools, Manufacturing, Programming languages, Robots, Vehicles.

For abstract, see STAR 1220

ORNL-TM-4625 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
RAPID, TWO-POINT METHOD FOR ESTIMATING THE PARAMETERS OF UNI- AND MULTIMODAL, LOG-NORMAL PROBABILITY DENSITY FUNCTIONS.
B. R. Fish. Jul 74, 19p
Contract W-7405-eng-26

Descriptors: Aerosols, Density, Distribution functions, Geometry, Iterative methods, Probability, Standards, Statistics, Variations.

For abstract, see NSA 30 08, number 23320.

ORNL-4957 PC$5.75/MF$2.25
Oak Ridge National Lab., Tenn.
NUMERICAL SOLUTION OF ILL-CONDITIONED SYSTEMS OF LINEAR EQUATIONS.
M. T. Heath. Jul 74, 55p
Contract W-7405-eng-26

Descriptors: (*Equations, *Numerical solution), Astronomy, Bibliographies, Geophysics, Iterative methods, Mathematical models, Mathematics, Medicine, Meteorology, Processing.

For abstract, see NSA 30 08, number 23319.

PB-235 527/9GA PC$7.00/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
A CLASS OF ALGORITHMS FOR AUTOMATIC EVALUATION OF CERTAIN ELEMENTARY FUNCTIONS IN A BINARY COMPUTER.
Doctoral thesis, Nov 68-Jun 70,
Bruce Gene De Lugish. 1 Jun 70, 194p 399
Grant NSF-GJ-813, NSF-GJ-812

Descriptors: *Transcendental functions, *Digital computers, *Computation, Exponential functions, Periodic functions, Radix conversion, Arithmetic, Algorithms, Theses.

The time required to evaluate elementary transcendental functions in a digital computer can often be significantly reduced by performing the algorithms in hardware rather than software form, providing that efficient hardware algorithms can be developed. Algorithms to evaluate common elementary functions to register length precision in from one to three 'multiplication cycle times' are developed; a 'multiplication cycle time' is defined as the time required to perform, on the average, M low precision comparisons, M shifting operations, and M/3 additions where M is the length of the mantissa of a floating-point operand. An increase in speed is achieved by introducing redundancy, that is, allowing more than r digital values in radix r so that the representation of numbers is no longer unique. The increase in hardware investment is moderate relative to the cost of the machine. (Modified author abstract)

PB-235 706/9GA PC$3.25/MF$2.25
Commonwealth Scientific and Industrial Research Organization, Melbourne(Australia). Div. of Mathematical Statistics.
TABLES FOR KENDALL'S TAU AND AN EXAMINATION OF THE NORMAL APPROXIMATION.
Technical rept.,
D. J. Best. 1974, 18p Technical paper-39, ISBN-0-643-00093-3

Descriptors: *Statistical analysis, *Ranking, Probability density functions, Normal density functions, Approximation, Australia, Subroutines, FORTRAN.

A recurrence relation for constructing the probability distribution of the score S associated with Kendall's tau for the distribution of n+1 objects from that for n objects is modified for use in a FORTRAN computer subroutine (appended). (Modified author abstract)

SAND-74-0057 PC$4.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
LOCAL ERROR CONTROL IN CODES FOR ORDINARY DIFFERENTIAL EQUATIONS.
L. F. Shampine. Jul 74, 32p
Contract AT(29-1)-789

Descriptors: (*Differential equations, *Errors), Computer codes, Computers, Control, Extrapolation, Numerical solution.

For abstract, see NSA 30 08, number 23324.

SLA-73-0058 PC$7.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
APPLICATION OF PREDICTOR–CORRECTOR ALGORITHMS TO THE DIRECT INTEGRATION OF SECOND ORDER ORDINARY DIFFERENTIAL EQUATIONS.
D. C. Williams. Jun 74, 79p
Contract AT(29-1)-789

Descriptors: (*Differential equations, *Numerical solution), Algorithms, Integral equations.

For abstract, see NSA 30 08, number 23327.

SLA-73-28-A PC$5.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
SET EQUATION TRANSFORMATION SYSTEM (SETS).
R. B. Worrell. Jul 74, 55p
Contract AT(29-1)-789

Descriptors: Algebra, Algorithms, Control, Equations, Fault tree analysis, Mathematical operators, Mathematics.

For abstract, see NSA 30 08, number 23326.

SLA-74-270 PC$4.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
CURVE FITTING BY POLYNOMIALS IN ONE VARIABLE.
L. F. Shampine, S. M. Davenport, and R. E. Huddleston. Jun 74, 28p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *P codes), (*Polynomials, *Least square fit), Data processing, Diagrams.

For abstract, see NSA 30 08, number 23330.

UCID-16558 PC$14.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: LECTURE NOTES.
A. C. Hindmarsh. Jun 74, 222p
Contract W-7405-Eng-48

Descriptors: (*Differential equations, *Numerical solution), Education, Lectures.

For abstract, see NSA 30 08, number 23336.

UCLA-34P214-2 PC$11.00/MF$2.25
California Univ., Los Angeles Dept. of Computer Science.
SYNTHESIS OF PROPERLY TERMINATING GRAPHS.
M. Yavne. Apr 74, 156p UCLA-ENG-7434
Contract AT(04-3)-34

Descriptors: Algorithms, Data processing, Diagrams, Programming.

For abstract, see NSA 30 08, number 23339.

USC-113P-65 PC$7.25/MF$2.25
University of Southern California, Los Angeles Dept. of Electrical Engineering.
EIGENVALUES OF ZIELKE'S MATRICES. TECHNICAL REPORT NO. RB73-39.
G. J. Tee. Aug 73, 80p
Contract AT(04-3)-113

Descriptors: (*Matrices, *Eigenvalues), Eigenvectors, Numerical solution, Polynomials, Scalars.

For abstract, see NSA 30 08, number 23340.

12B. Operations Research

AD-785 722/0GA Reprint
Florida Univ Gainesville
DISTRIBUTION-FREE APPROXIMATIONS FOR CHANCE CONSTRAINTS.
F. M. Allen, R. N. Braswell, and P. V. Rao. 2 Mar 72, 14p AROD-T-1.105-RT
Contract DAHC04-68-C-0002
Availability: Pub. in Operations Research, v22 n3 p610-621 May-Jun 74.

Descriptors: *Linear programming, Distribution functions, Approximation, Set theory, Theorems.
Identifiers: Constraints.

This paper concerns developing methods for approximating a chance-constrained set when any information concerning the random variables must be derived from actual samples. Such a situation has not been presented in the literature. When existing chance-constrained programming techniques are used, it is not possible to relate the accuracy of sample-based assumptions to actual constraint satisfaction. The methods presented here employ the concept of a distribution-free toletance region to construct various sets whose elements have the common property of satisfying the chance constraint with a preassigned level of confidence. The sample size required to meet the desired confidence is readily available in tabular or graphical form. (Author)

AD-785 866/5GA PC$3.25/MF$2.25
Stanford Univ Calif Dept of Operations Research
OPTIMAL ALLOCATION OF RESOURCES IN SYSTEMS.
Technical rept.,
C. Derman, G. J. Lieberman, and S. M. Ross. 3 Sep 74, 22p Rept no. TR-164
Contract N00014-67-A-0112-0052

Descriptors: *Allocations, Mathematical models, Convex sets, Money, Reliability.

Identifiers: Resource allocation, *Allocation models.

In the design of a new system, or the maintenance of an old system, allocation of resources is of prime consideration. In allocating resources it is often beneficial to develop a solution that yields an optimal value of the system measure of desirability. In the context of the problems considered in this paper the resources to be allocated are components already produced (assembly problems) and money (allocation in the construction or repair of systems). The measure of desirability for system assembly will usually be maximizing the expected number of systems that perform satisfactorily and the measure in the allocation context will be maximizing the system reliability.

AD-785 908/5GA Not available NTIS
North Carolina State Univ Raleigh Operations Research
LECTURE NOTES IN ECONOMICS AND MATHEMATICAL SYSTEMS. 86. SYMPOSIUM ON THE THEORY OF SCHEDULING AND ITS APPLICATIONS,
S. E. Elmaghraby. 1973, 150p
Contract N00014-70-A-0120-0002
Library of Congress Catalog Card no. 73-14483.
Availability: Paper copy available from Springer-Verlag, 175 Fifth Ave., New York. $14.60 as ISBN-0-387-06437-0; also available as ISBN-0-387-06437-0; also available as ISBN-3-540-06437-0.

Descriptors: *Scheduling, *Meetings, Mathematical programming, Railroads, Naval shore facilities, Chemical engineering, Machine shop practice, Production, Network flows, Optimization.
Identifiers: Assignment problems.

The theory of scheduling is receiving increased emphasis in research and practice for at least three good reasons. First, the management of large scale projects resolves itself, in the final analysis, into problems of scheduling interacting activities subject to limited resources. Second, a great deal of 'fat' that used to exist in the past in production, distribution, and service systems is eliminated, thanks to tighter managerial controls in information systems. in financial management, in logistics, and in many other facets of industrial enterprises and military installations. Tighter scheduling methods are therefore called for. Third, the study of scheduling problems involves the study of combinatorial problems and optimization over discrete spaces which represent a radical, and interesting, departure from classical mathematics.

AD-785 912/7GA PC$3.75/MF$2.25
Stanford Univ Calif Systems Optimization Lab
COMPUTATIONAL EXPERIENCE WITH LARGE-SCALE LINEAR COMPLEMENTARITY PROBLEMS.
Technical rept.,
Richard W. Cottle. Sep 74, 35p Rept no. SOL-74-13
Contracts N00014-67-A-0112-0011, AT(04-3)-326

Descriptors: *Quadratic programming, *Computations, Linear programming, Matrices(Mathematics), Iterations.
Identifiers: *Complementarity problem, Duality theory.

This paper contains a brief summary of some computational experience acquired by the Systems Optimization Laboratory at Stanford University on linear complementarity problems of intermediate to large size. (Author)

AD-786 064/6GA Reprint
George Washington Univ Washington D C
ALTERNATIVE PROOFS OF THE CONVERGENCE PROPERTIES OF THE CONJUGATE-GRADIENT METHOD,
G. P. McCormick, and K. Ritter. 1974, 24p AROD-11505.4-EL
Contracts DAHC04-73-C-0009, DA-31-124-ARO(D)-462
Prepared in cooperation with Stuttgart Univ. (West Germany). Mathematisches Institut.
Availability: Pub. in Jnl. of Optimization Theory and Applications, v13 n5 p497-518 May 74.

Descriptors: *Mathematical programming, Convergence, Theorems.
Identifiers: *Conjugate gradient method.

For the problem of minimizing an unconstrained function, the conjugate-gradient method is shown to be convergent. If the function is uniformly strictly convex, the ultimate rate of convergence is shown to be n-step superlinear. If the Hessian matrix is Lipschitz continuous, the rate of convergence is shown to be n-step quadratic. All results are obtained for the reset version of the method and with a relaxed requirement on the solution of the stepsize problem. In addition to obtaining sharper results, the paper differs from previously published ones in the mode of proof which contains as a corollary the proof of finiteness of the conjugate-gradient method when applied to a quadratic problem rather than assuming that result. (Author)

AD-786 190/9GA PC$3.75/MF$2.25
Pennsylvania State Univ University Park Coll of Business Administration
NONCOMPENSATORY PREFERENCES.
Technical rept.,
Peter C. Fishburn. Sep 74, 30p Rept no. TR-11
Contract N00014-67-A-0385-0021

Descriptors: *Decision making, Set theory, Theorems.
Identifiers: Preferences, Axioms.

This study presents and analyzes a general characterization of noncompensatory preference structures in multiattribute preference theory, then examines a variety of special conditions that may hold for such structures.

AD-786 195/8GA PC$3.25/MF$2.25
Pennsylvania State Univ University Park Coll of Business Administration
A NOTE ON SEMIORDERS AND CHOICE FUNCTIONS.
Technical rept.,
Peter C. Fishburn. Sep 74, 9p Rept no. TR-13
Contract N00014-67-A-0385-0021

Descriptors: *Decision making, Mathematical models, Set theory, Theorems.
Identifiers: *Preferences, Axioms, *Choice making.

With P a binary preference relation on a set of decision alternatives let C(X) be the P-maximal in X for each non-empty subset X of alternatives. Conditions on the choice function C are given for each of five types of P relations so that the conditions on C hold if and only if the P relation is of the specified type. The types of relations covered are acyclic orders, strict partial orders, semitransitive orders, interval orders and semiorders. (Author)

AD-786 196/6GA PC$3.25/MF$2.25
Pennsylvania State Univ University Park Coll of Business Administration
REPRESENTABLE CHOICE FUNCTIONS.
Technical rept.,
Peter C. Fishburn. Sep 74, 23p Rept no. TR-14
Contract N00014-67-A-0385-0021

Descriptors: *Decision making, Mathematical models, Set theory, Theorems.
Identifiers: *Choice making, Axioms, Preferences.

A choice function, which maps each set of alternatives in a domain of feasible sets into a non-empty subset of itself (called the choice set), is said to be representable by a weak order if some weak order on the alternatives has maximum elements within each feasible set, all of which are in the choice set of that feasible set. A Partial Congruence Axiom ('every non-empty finite collection of feasible sets has an alternative which is in the choice set of every feasible set in the collection which contains that alternative') is shown to be necessary and sufficient for weak order representability when all choice sets are finite. (Modified author abstract)

AD-786 220/4GA PC$3.25/MF$2.25
Washington Univ Seattle
CONVEX POLYHEDRA AND MATHEMATICAL PROGRAMMING.
Technical rept.,
Victor Klee. Sep 74, 14p Rept no. TR-50
Contract N00014-67-A-0103-0003

Descriptors: *Mathematical programming, *Combinatorial analysis, Linear programming, Convex sets, Algorithms.
Identifiers: *Convex polyhedra.

The article surveys the status of certain questions about the combinatorial structure of convex polyhedra, with emphasis on four problems of special relevance to mathematical programming.

AD-786 283/2GA Reprint
Florida Univ Gainesville
A NETWORK FLOW SOLUTION TO A MULTIFACILITY MINIMAX LOCATION PROBLEM INVOLVING RECTILINEAR DISTANCES,
R. L. Francis, and P. M. Dearing. 8 Feb 73, 19p
AROD-11621.6-M
Grant DA-ARO-D-31-124-73-G149
Prepared in cooperation with Cornell Univ., Ithaca, N.Y.
Availability: Pub. in Transportation Science, v8 n2 p125-141 May 74.

Descriptors: *Network flows, Minimax technique, Facilities, Linear programming, Theorems.
Identifiers: Location problems.

The problem considered is to locate new facilities with respect to existing facilities so as to minimize the maximum cost; costs are incurred that are linearly proportional to the rectilinear distances between new and existing facilities, or to the rectinlinear distances between new facilities. Constraints on the distances between facilities are also included in the problem formulation. It is shown that the problem can be decomposed into two subproblems that have identical structure, and that may be solved independently. Each subproblem is solved efficiently by converting it into an equivalent network flow problem that is in turn solved by determining a simple chain of maximum 'cost' to 'weight' ratio. (Author)

JUL-1064-MA PC$4.50/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Zentralinstitut fuer Angewandte Mathematik.
QUADRATIC PROGRAMMING BY SUCCESSIVE OVERRELAXATION.
U. Eckhardt. Apr 74, 27p
U.S. Sales Only.

Descriptors: Efficiency, Iterative methods, Least square fit, Mathematics, Numerical solution, Programming, Variations.

For abstract, see NSA 30 08, number 23306.

N74-29541/1GA PC$6.50/MF$2.25
Leeds Univ. (England). Operational Research Unit.
OPTIMAL PROJECT SCHEDULING UNDER MULTIPLE RESOURCE CONSTRAINTS.
A. Humphreys, and T. Scheurer. May 73, 67p
REPT-19

Descriptors: *Algorithms, *Optimization, *Scheduling, Computer programming, Management planning, Project management, Trees (Mathematics).

For abstract, see STAR 1219

N74-30550/9GA PC$4.25/MF$2.25
Rice Univ., Houston, Tex. Dept. of Economics and Mathematical Sciences.
FINITE PURE INTEGER PROGRAMMING ALGORITHMS EMPLOYING ONLY HYPERSPHERICALLY DEDUCED CUTS.
Final Report.
R. D. Young. 3 May 71, 25p NASA-CR-139561
Contract NGR-44-006-128

Descriptors: *Algorithms, *Computer programming, *Hyperspheres, *Integers, Analysis (Mathematics), Computer programs, Hyperplanes, Set theory.

For abstract, see STAR 1220

PB-235 754/9GA PC$3.75/MF$2.25
California Univ., Berkeley. Operations Research Center.
ON THE OPTIMALITY OF HUFFMAN TREES,
C. Roger Glassey, and Richard M. Karp. Jul 74, 26p ORC-74-21
Grant NSF-GP-30961, NSF-GJ-474

Descriptors: *Dynamic programming, *Trees(Mathematics), Search theory, Graph theory, Inequalities, Theorems.
Identifiers: Huffman codes.

Huffman's well-known algorithm for the construction of optimal search trees is shown to have a more general optimality property than was previously known. A corollary of this general optimality property yields explicitly the optimal policy for the dynamic programming recurrence F(n)= f(n)+ Min (1<=j< or=(n-1)) F(j)+F(n-j), where f is concave nondecreasing. Several one-dimensional search problems are described which give rise to this recurrence.

TID-26598 PC$6.25/MF$2.25
Illinois Univ., Chicago Dept. of Information Engineering.
DECISION THEORY METHOD FOR THE ANALYSIS OF TEXTURE.
B. H. McCormick, and S. N. Jayaramamurthy. 1974, 61p
Contract AT(11-1)-2118

Descriptors: Analytical solution, Configuration, Images, Mathematics, Optical properties, Shape, Statistics, Texture, Vision.

For abstract, see NSA 30 08, number 23331.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-786 093/5GA PC$3.75/MF$2.25
Coast Guard Washington D C Applied Technology Div
REMOTE CONTROL OF A NETWORK OF MAJOR LIGHTS.
Final rept. Oct 64-Nov 68,
J. A. McIntosh. Jan 69, 36p

Descriptors: *Navigational lights, Remote control, Networks, Control, Long Island Sound.
Identifiers: COMAND system.

The paper is the final report on the installation of a system for the remote COntrol and Monitoring of the major Aids to Navigation ('COMAND' System) in Coast Guard Group, Eaton's Neck, which consists of six stations in Long Island Sound, located about 50 miles east of New York City. This report contains a description of the system as built, as well as some information on cost and reliability experience. Also, some opinion as to possible changes and improvements to be included in the design of future installations has been included. The basic report is rather general as to the details of construction, etc. Detailed information appears in the appendices or in the appropriate manufacturer's manuals.

PB-235 482/7GA PC$3.75/MF$2.25
McDonnell Douglas Astronautics Co.-West, Huntington Beach, Calif.
THE ELIMINATION OR CONTROL OF MATERIAL PROBLEMS IN WATER HEAT PIPES.
Semi-Annual progress rept. 1 Jan-30 Jun 74,
G. F. Pittinato. 31 Jul 74, 29p MDC-G5481-A,
NSF/RANN/SE/GI-41310/PR/74/2 NSF/RA/N-74-066
Grant NSF-GI-41310
See also PB-233 936.

Descriptors: *Heat exchangers, Water, Solar energy, Stainless steels, Nickel alloys, Inconel, Monel, Tests.
Identifiers: *Heat pipes, Steel 347, Steel 316, Steel 430, Nickel alloy Monel 400, Iron alloy Incoloy 800.

Several different concepts for using solar energy involve the use of heat pipes to transport energy within the systems. Two 347 SS water heat pipes measuring 86.5 cm long were fabricated with one of the pipes containing a 200 mesh 347 SS screen wick. Fourteen additional heat pipes measuring 76 cm long were also fabricated, two from each of the following materials: 347 SS, 316 SS, 430 SS, Monel 400, Inconel 600, Incoloy 800, and CDA 715. Except for the 430 SS, a cleaning procedure was established for removing the oxide formed during welding. The furnaces and temperature control and monitoring equipment have been installed and the heat pipes are presently being instrumented. All of the heat pipes will be tested. (Modified author abstract)

RT/ING-(74)7 PC$6.25/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
BURN-OUT CORRELATION TO SCALE WATER WITH FREON.
M. Cumo, C. Maciuca, M. Moronesi, and G. Palazzi. Feb 74, 64p
U.S. Sales Only.

Descriptors: (*Steam generators, *Burnout), Correlations, Freons, Water.

For abstract, see NSA 30 08, number 23473.

UCID-15462 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
HEAT-PIPE OPTIMIZATION CODE, LAM2.
J. L. Watts. 2 Apr 69, 15p

Descriptors: (*Heat pipes, *Optimization), (*Computer codes, *L codes).

For abstract, see NSA 30 08, number 23486.

Y-EC-195(Rev.1) PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
DESIGN ASPECTS OF A MULTIWALL 1750 EXP 0 C FURNACE FOR 20,000 PSI ARGON OPERATION.
C. H. Curtis, and H. A. Pohto. 19p CONF-740606-17
Contract W-7405-eng-26

Descriptors: (*Furnaces, *Design), High temperature.

For abstract, see NSA 30 08, number 23495.

13B. Civil Engineering

AD-785 747/7GA PC$3.75/MF$2.25
California Univ Berkeley Hydraulic Engineering Lab
BOLINAS LAGOON INLET, CALIFORNIA.
Miscellaneous paper,
J. W. Johnson. May 74, 47p Rept no. HEL-24-15 CERC-MP-3-74

Descriptors: *Inlets(Waterways), *Harbors, Tides, Ocean waves, Engineering, Drift, Maintenance, Sediment transport, Hydrography, Sedimentation, California.
Identifiers: *Bolinas Lagoon Inlet, Design, Lagoons(Ponds), Littoral drift, *Tidal hydraulics.

The hydraulic and sedimentary characteristics of tidal inlets on sandy coasts have long been of interest to engineers involved in harbor design and maintenance. O'Brien (1931), in a study of west coast inlets, proposed a relationship between the minimum inlet area below mean sea level and the tidal prism. The Bolinas Bay-Bolinas Lagoon system is a natural laboratory in which a large amount of data has been compiled on hydrography, wave action, tidal hydraulics, sediment transport and sedimentation, and the ecosystem. (Modified author abstract)

AD-785 955/6GA PC$5.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
AN ANALYSIS OF THE AIR QUALITY MONITORING PROGRAM IN THE WRIGHT-PATTERSON AIR FORCE BASE VICINITY.
Master's thesis,
Gary V. Harkcom. Aug 74, 129p Rept no. SLSR-20-74B

Descriptors: *Air pollution, *Monitoring, *Air Force facilities, Theses, Standards, Atmospheric motion, Ohio, Particulates, Sulfur oxides, Nitrogen oxides, Carbon monoxide, Hydrocarbons.
Identifiers: Air pollution, Wright-Patterson Air Force Base, Dayton(Ohio), Air quality data.

The purpose of this study was to provide an evaluative test of the air quality monitoring network pertinent to the vicinity of Wright-Patterson AFB (WPAFB), Ohio. A review of air pollution dispersion literature was used as a basis for formulating the test standards. An evaluative analysis was performed for each of the five primary air pollutants (particulates, sulfur dioxide, nitrogen oxides, carbon monoxide, and hydrocarbons) and for one secondary pollutant (photochemical oxidants) under typical meteorological conditions. An additional test was also performed for each pollutant on the city of Dayton, Ohio, during simulated inversion air conditions. The analyses attempted to identify major discrepancies between the air monitoring network and the critical air sampling areas identified by this study. The study has concluded that the air monitoring network for the WPAFB vicinity is generally adequate, with the major exception being the city of Dayton. (Modified author abstract)

AD-786 028/1GA PC$3.75/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
AN APPLICATION OF INFRARED REMOTE SENSING TECHNIQUES TO ECOLOGICAL PROBLEMS.
Technical rept.,
L. W. Crouch, and R. D. Mower. Jul 74, 49p* Rept no. AFAL-TR-74-98

Descriptors: *Infrared scanning, *Thermography, *Water pollution, *Thermal pollution, Infrared equipment, Infrared photography, Meteorology, Heat.
Identifiers: *Remote sensing.

The report and compendium of aerial infrared imagery was extracted from an R and D laboratory test of an Air Force infrared scanner. The purpose of the R and D test was to demonstrate the ability of one Air Force scanner to display thermal differentials found in a ground scene. The flight test area included a series of waterways and contiguous shorelines which illustrate ecological thermal phenomena. Specific examples of imagery were extracted from the R and D test program data for inclusion in this report. A summary of pertinent infrared technology is presented which relates sensor performance to atmospheric conditions, target and background characteristics, as well as image information content. In addition, brief photographic interpretation comments are included for each infrared image. (Author)

COM-74-11496/8GA
Mag Tape (Lease Only) $300.00/month
National Bureau of Standards, Washington, D.C. Technical Analysis Div.
CITY GAMES, CITY III,
John E. Moriarty. Aug 73, 2 reels mag tape
NBS/DF-73/009
Available on lease only, $300.00/month. Foreign sales subject to negotiation. Specify tape recording mode desired: 7 track, 556 or 800bpi, Bcd, odd or even parity; or 9 track, 800bpi, Ebcdic, odd parity. Lease price includes documentation; COM-73-10216, COM-73-10217 and COM-74-10703-1.

Descriptors: *Management games, *Urban planning, *Decision making, Computerized simulation, Economic engineering, Government policies, Social planning, Magnetic tapes.
Identifiers: *City 3 system, City games.

CITY III is an operational simulation game in which participants make economic, government, and social decisions affecting a hypothetical metropolitan area. Through the use of a computer, the simulated urban system responds to the participants as any real city would. The tapes and cards from this file along with a player's and director's manual are required for a game play.

CONF-730802 PC$13.60/MF$2.25
Oak Ridge National Lab., Tenn.
PROCEEDINGS OF THE FIRST ANNUAL NSF TRACE CONTAMINANTS CONFERENCE, OAK RIDGE NATIONAL LABORATORY, AUGUST 8--10, 1973.
W. Fulkerson, W. D. Shults, and R. I. Van Hook.
Mar 74, 775p

Descriptors: (*Environment, *Pollution), Biological effects, Chemical analysis, Diffusion, Mathematical models, Meetings, Monitoring, Trace amounts.

For abstract, see NSA 30 08, number 20579.

E74-10746 PC$3.25/MF$2.25
Delaware Univ., Newark. Coll. of Marine Studies.
MONITORING THE DISPERSION OF OCEAN WASTE DISPOSAL PLUMES FROM ERTS-1 AND SKYLAB.
V. Klemas, G. Davis, and T. Myers. 18 Sep 74, 2p
NASA-CR-139986
Contracts NAS5-21837, NAS1-12304

Descriptors: Delaware, Waste disposal, Atlantic Ocean, Coastal water, EREP, Skylab program, Earth resources program, Plumes, Titanium oxides, Acids, Iron compounds, Sulfates, Chlorides.

The author has identified the following significant results. About forty miles off the Delaware coast is located the disposal site for waste discharged from a plant processing titanium dioxide. The discharge is a greenish-brown, 15-20% acid liquid which consists primarily of iron chlorides and sulfates. The barge which transports this waste has a 1,000,000 gallon capacity and makes approximately three trips to the disposal site per week. ERTS-1 MSS digital tapes are being used to study the dispersion patterns and drift velocities of the iron-acid plume. Careful examination of ERTS-1 imagery disclosed a fishhook-shaped plume about 40 miles east of Cape Henlopen caused by a barge disposing acid wastes. The plume shows up more strongly in the green band than in the red band. Since some acids have a strong green component during dumping and turn slowly more brownish-reddish with age, the ratio of radiance signatures between the green and red bands may give an indication of how long before the satellite overpass the acid was dumped. Enlarged enhancements of the acid waste plumes, prepared from the ERTS-1 MSS digital tapes aided considerably in studies of the dispersion of the waste plume. Currently acid dumps are being coordinated with ERTS-1 overpasses.

JPRS-62812 PC$4.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
TRANSLATING ON ENVIRONMENTAL QUALITY. NO. 50.
26 Aug 74, 60p
Trans. of monos. from various jnls. See also No. 49, JPRS-62793 and No. 51, JPRS-62838.

Descriptors: *Environmental quality, *Pollution, Translations, Asia, USSR, Peoples Republic of China, Brazil, Water pollution, Mercury, Molybdenum, Arsenic, Air pollution, Oil pollution.
Identifiers: Latin America.

Contents:
- People's Republic of China--The pollution of rivers;
- On environmental protection and chemistry;
- Mercury-containing liquid waste pollution and its control;
- Determination of trace amounts of mercury, molybdenum and arsenic in water;
- Brazil--Air, water pollution problem nears critical stage;
- Prevention of oil spillage into river waterways.

JPRS-62838 PC$4.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 51.
28 Aug 74, 58p
Trans. of monos. from various jnls. See also no. 50, JPRS-62812.

Descriptors: *Environmental quality, *Pollution, Translations, Ivory Coast, Togo, Poland, Romania, Columbia, Kuwait, Turkey, Africa, Europe, USSR, Air pollution, Water pollution, Noise reduction, Conservation.
Identifiers: Near East, Latin America.

Contents:
- Report on symposium on combating pollution;
- Pugwash committee session on environment;
- National corporation for forestry research to be established;
- Action required to combat pollution in the Al-Shu'aybah area;
- Marmara's water pollution problems discussed;
- The fight against noise pollution;
- Preservation of the environment in the Don basin;
- Legal aspects of environmental protection in the Northern Caucasus reviewed;
- Penalties for violation of fishing regulations in Uzbekistan cited;
- and Pollution in Tallin, the burning of trash.

ORNL-NSF-EP-72 PC$8.75/MF$2.25
Oak Ridge National Lab., Tenn.
ADVANCED TECHNIQUES FOR AQUEOUS PROCESSING AND POLLUTION ABATEMENT. FINAL REPORT, OCTOBER 1972--MARCH 1974.
R. E. Minturn. Aug 74, 114p
Contract W-7405-eng-26

Descriptors: Filtration, Liquid wastes, Membranes, Waste processing, Water pollution.

For abstract, see NSA 30 08, number 23370.

ORO-4395-1 PC$4.00/MF$2.25
Norfolk State Coll., Va.
WIND EFFECTED REDISTRIBUTION OF SURFACE CONTAMINATION. PROGRESS REPORT, SEPTEMBER 1973--AUGUST 1974.
A. J. Amato. 1974, 4p
Contract AT(40-1)-4395

Descriptors: Air pollution, Computers, Distribution, Disturbances, Earth atmosphere, Gases, Mathematical models, Particles, Surface contamination, Wind.

For abstract, see NSA 30 08, number 23342.

PB-235 165/8GA PC$8.50/MF$2.25
Transportation Research Board, Washington, D.C.
ISSUES IN STATEWIDE TRANSPORTATION PLANNING HELD AT WILLIAMSBURG, VIRGINIA ON 21-24 FEBRUARY 1974.
Special rept.,
Roger L. Creighton. Feb 74, 269p* TRB-SR-74-146

Descriptors: *Transportation planning, *Meetings, *Virginia, Urban transportation, Cost analysis, Transportation methods.
Identifiers: Multimodal transportation.

Summaries of the findings of the workshops and of the conference papers are followed by descriptions of research projects that were recommended to be undertaken to give statewide transportation planning the methodological base and administrative direction required. Issues given primary consideration were analytical techniques for developing multimodal transportation alternatives; measuring performance of major transportation modes in terms of user, community, environmental, and operator costs; and estimating dollar costs and social benefits of alternative growth patterns and transportation systems to serve them.

PB-235 227/6GA PC$10.25/MF$2.25
Argonne National Lab., Ill.
OHIO RIVER COOLING WATER STUDY.
Final rept.,
Brian P. Butz, Donald R. Schregardus, Barbara-Ann Lewis, Anthony J. Policastro, and James J. Reisa, Jr. Jun 74, 378p EPA-905/9-74-004

Descriptors: *Thermal pollution, *Cooling water, *Ohio River, *Aquatic biology, Environmental impacts, Heat stress, Thermal shock, Aquatic plants, Temperature distribution, Aquatic animals, Evaluation, Mathematical models, Water quality, Heat budget, Predictions.
Identifiers: *Water quality data, Water temperature, COLHEAT computer program, STREAM computer program, Edinger-Geyer computer program.

The study presents a review and critique of existing technical information relevant to the environmental effects of the use of the Ohio River main stem for cooling. In order to evaluate the effect of heat discharges on the indigenous aquatic life of the Ohio River, an extensive review and critique of past and existing studies dealing with the biological aspects of cooling water was undertaken. In order to judge the effect of heat discharges on the thermal regime of the river, three one-dimensional river temperature prediction models--COLHEAT, STREAM and Edinger-Geyer were evaluated, and the most appropriate model was selected to analyze changes in temperature distribution along the river. The effects of heat discharges on the thermal regime of the river near the points of discharge were evaluated by analyzing and critiquing available thermal plume study results.

PB-235 247/4GA PC$4.75/MF$2.25
California State Dept. of Parks and Recreation, Sacramento.
THE SIERRA FOOTHILLS AND LOW COASTAL MOUNTAIN PROVINCE. LANDSCAPE PRESERVATION STUDY.
Final rept.,
Eugene R. Kunit, and Karen S. Calhoon. Sep 73, 79p OPR-74-08
Prepared by Royston, Hanamoto Beck and Abey, San Francisco, Calif. See also PB-235 248.

Descriptors: *Regional planning, *Land use, *Recreational facilities, *California, Esthetics, Natural resources, Protection, Mountains, Coasts, Population growth, Sites.

California has rich values in its geology, climate, soils, and a unique and complex biota. Because diverse values occur in the same area, use of one value may tend to inhibit the use of or destroy another. Population growth and mobility have intensified the conflict. To study California's rich natural values, the State has been divided into nine provinces. The Sierra Foothill and Low Coastal Mountain Province Landscape Preservation Study identifies the remaining natural remnants of statewide significance in need of protection in the Sierra Foothill and Low Coastal Mountain Province. The report includes a brief review of the filter system used to select the sites and the geologic, biotic, scenic and endangerment factors. General information, such as boundaries, natural resources, and project priority ranking of the province is included.

PB-235 248/2GA MF$2.25
California State Dept. of Parks and Recreation, Sacramento.
THE SIERRA FOOTHILL AND LOW COASTAL MOUNTAIN PROVINCE. LANDSCAPE PRESERVATION STUDY. APPENDIX.
Final rept.,
Eugene R. Kunit, and Karen S. Calhoon. Sep 73, 194p OPR-74-08-App
Prepared by Royston, Hanamoto, Beck and Abey, San Francisco, Calif. See also PB-235 247.

Descriptors: *Regional planning, *Land use, *Recreational facilities, *California, Esthetics, Indexes(Documentation), Plants(Botany), Conservation, Aquatic animals, Bibliographies, Mountains, Coasts.

California's outstanding geology and biota need preservation. Because these diverse values occur in the same area, the use of one value may inhibit the use or destroy another. Volume I of the Sierra Foothill and Low Coastal Mountain Study presents general coverage of the information in the Appendix. The Sierra Foothill and Low Coastal Mountain Province Appendix consists of a detailed description of the filter system for project selection: The scores received by the candidate areas on each level of the filter; a list of rare and endangered species of plants; precise maps of the recommended preservation sites; a list of common plant and animal species and their biotic communities; and a significant bibliography.

PB-235 259/9GA PC$3.25/MF$2.25
West Virginia Univ., Morgantown. Water Research Inst.
A DIVERSITY INDICES COMPUTER PROGRAM FOR USE IN AQUATIC SYSTEMS EVALUATION,
E. C. Keller, Jr., and J. A. Silvester. 1974, 21p Information-3, WRI-WVU-74-01 W74-11463, OWRR-B-001-WVA(5)
Contract DI-14-31-0001-3351

Descriptors: *Water pollution, *Ecology, *Aquatic biology, Computer programs, Water quality, Computerized simulation, Mathematical models, Classifications, Indices(Ratios), FORTRAN.
Identifiers: Ecosystems, FORTRAN 4 programming language, Water pollution effects(Animals).

A detailed description and documentation are presented of a FORTRAN IV program called 'DIVERSITY'. Developing the program was an effort to solve the difficulties that are apparent when one attempts to evaluate community structures and relationships in an aquatic system and was brought about by the search for a broad-based set of indices and criteria to characterize the selected ecosystems being studied. The program is flexible and applied and has broad capabilities of performing certain functions useful in the summarization and simultaneous evaluation of sets of ecological data and for interpretation and evaluation of community structures. The program calculates diversity indices and tables of numbers and percentages for various arrangements of species into different groupings.

PB-235 310/0GA PC$5.25/MF$2.25
California Univ., Davis. Water Resources Center.
WATER SUPPLIES AND COSTS IN RELATION TO FARM RESOURCE DECISIONS AND PROFITS ON SACRAMENTO VALLEY FARMS,
Trimble R. Hedges. Aug 74, 112p UCAL-WRC-W-111 W74-11568, OWRR-B-068-CAL(1)

Descriptors: *Water supplies, *Farmcrops, *Irrigation, *Agricultural economics, *Sacramento Valley, Cost analysis, Prices, Farms, Linear programming, Allocations, Profits, Decision making, Management, Models, California.
Identifiers: *Farm management, *Water costs, Water allocation(Policy), Local studies.

The study of the mixed crop agricultural economy of Sacramento Valley, California identifies and establishes physical input-output relationships for water and crop yields within relevant ranges, evaluates the impact of prices for products and costs for input factors upon water allocation among such crops and alternative irrigation practices and maximum earnings and profits. Linear programming is used to evaluate the various constraints of water supply, land quality, crop prices, and input costs for the several crops and sizes of farms. Two sizes of farms are analyzed in the study.

PB-235 311/8GA PC$7.00/MF$2.25
Georgia Inst. of Tech., Atlanta. Environmental Resources Center.
LAND DISPOSAL OF WASTEWATER: PROCESSES, DESIGN CRITERIA, AND PLANNING CONSIDERATIONS.
Master's thesis,
John P. Hartigan, Jr. Aug 74, 177p ERC-1074 W74-11569

Descriptors: *Land use, *Sewage disposal, *Water pollution control, Waste water, Fluid flow, Irrigation, Economic factors, Soils, Ion exhanging, Loading, Waste water reuse, Plants(Botany), Fluid infiltration, Vaporizing, Terrain, Theses.
Identifiers: *Overland flow, *Sewage irrigation.

The national goal of higher water quality has rejuvenated interest in developing land surfaces for use in wastewater treatment. Wastes may be applied by spray irrigation, overland flow, or rapid infiltration. The land surface renovates the water through the processes of filtration, volatization, plant-uptake, ion exchange, and fixation. The application techniques vary in site requirements; sites vary in climate and topography; soils vary in process efficiency; wastes vary in the processes effective in their removal; people vary in expertise, and many disciplines can contribute to comprehensive system design. Out of all these relationships, the important parameters in the design of a land disposal system are the characteristics of the wastewater, the water quality goals, possible wastewater loading rates, wetting and drying schedules to maintain infiltration rates, size of the available treatment area, type of vegetative cover, and the capacity to store wastes during periods when disposal on the land surface is not advisable. The report synthesizes the above considerations into a standard planning process.

PB-235 319/1GA PC$4.75/MF$2.25
Vermont State Agency of Environmental Conservation, Montpelier.
STATE OF VERMONT AGENCY OF ENVIRONMENTAL CONSERVATION. SOLID WASTE MANAGEMENT AND RESOURCE RECOVERY PLAN.
Jan 73, 85p VAEC/SW-74-01
Prepared by Resource Planning Associates, Inc., Cambridge, Mass.

Descriptors: *Solid waste disposal, *Reclamation, Vermont, Storage, Collection, Materials recovery, Energy, Financing, Local government, State government, Legislation, Taxes, Organizing, Economic analysis, Industrial wastes, Earth fills, Incinerators, Land use.
Identifiers: *Waste recycling, Sanitary landfills.

Vermont has chosen a distinctive approach to solid waste management. Act No. 252 of the Acts of 1971 made very clear that recycling is more than a possible alternative; it is a positive goal in managing Vermont's solid waste needs. The statewide Solid Waste Management-Resource Recovery Plan is intended to be a working document, capable of providing for centralized direction where it is essential, yet accomodating local particularities to the fullest extent possible. The plan includes a policy statement, concentration on an anaylsis of the municipal waste stream and development of rates of waste composition, generation and seasonal variation specific to Vermont.

PB-235 331/6GA PC$7.50/MF$2.25
Ross, Hardies, O'Keefe, Babcock and Parsons, Chicago, Ill.
EPA AUTHORITY AFFECTING LAND USE.
Final rept.,
Fred P. Bosselman, Duane A. Feurer, and David L. Callies. 12 Mar 74, 230p* EPA-230/3-74-012
Contract EPA-68-01-1560

Descriptors: *Land use, *Project planning, *Centralized control, Legislation, Government policies, National government, Local government, Coordination, Water quality, Air pollution, Noise(Sound), Solid waste disposal, Environmental impacts.

The study examines existing EPA statutory and regulatory authority which involve land use requirements or implications. There is a direct relationship between land use control measures and environmental impacts. Many pollution problems can be prevented by implementing land use controls with proper consideration of environmental impact. The study is designed to highlight issues which confront EPA regulatory efforts. It includes an analysis of land use impact of programs implemented under the Clean Air Act, the Marine Protection Research and Sanctuaries Act, the Noise Control Act, and the Solid Waste Disposal Act. Those authorities are set forth in the context of influence on land use making process. The discussion emphasizes state and local responsibility. The study concludes with a section on existing methods to coordinate agency programs having significant implication for land use decisions including NEPA, the A-95 clearinghouse process, and the IGA program (Integrated Grants Administration).

PB-235 338/1GA PC$4.25/MF$2.25
Oklahoma Agricultural Experiment Station, Stillwater.
LOW ENERGY MECHANICAL METHODS OF RESERVOIR DESTRATIFICATION.
Final technical completion rept., 1 Jul 71-30 Jun 74,
James E. Garton, Charles E. Rice, James M. Steichen, and Jorge E. Quintero. 30 Jun 74, 54p W74-11572, OWRR-A-028-OKLA(1)
Contract DI-14-31-0001-4036

Descriptors: *Water pollution, *Reservoirs, *Axial flow pumps, Surface waters, Stratification,

Bottom water, Pumping, Design, Physical properties, Water masses, Water quality, Chemical properties, Efficiency, Construction, Test methods, Aeration.
Identifiers: *Destratification, Reaeration.

The objective was to evaluate reservoir stratification causing degradation of large volumes of water each summer. Many attempts have been made to destratify lakes. Generally, destratification devices have large power requirements. The first phase of the research involved the design, construction and testing of a high volume, low head destratification pump. In the second phase this axial flow pump was modified and was capable of moving 0.99 cubic meters per second of water from near the surface to near the bottom of the lake using 373 watts. The chief objective of the second phase was to determine the effectiveness of the pump as a destratification device.

PB-235 556/8GA PC$7.25/MF$2.25
General Electric Co., Santa Barbara, Calif. TEMPO.
POLLUTED GROUND WATER: A REVIEW OF THE SIGNIFICANT LITERATURE.
Environmental monitoring series,
David K. Todd, and Daniel E. McNulty. Mar 74, 224p* W74-11800, EPA-600/4-74-001
Contract EPA-68-01-0759
See also PB-232 117.

Descriptors: *Ground water, *Water pollution, Sources, Reviews, Legislation, Monitors, Earth fills, Urban areas, Septic tanks, Lagoons(Ponds), Industrial waste treatment, Radioactive contaminants, Injection wells, Salt water intrusion, Agricultural wastes, Public health.
Identifiers: Path of pollutants.

A selective review is presented of the literature on man-caused groundwater pollution, including causes and occurrence, procedures for control, and methods for monitoring. References cited by number in the text are listed in complete bibliographic form at the end of the report together with an author index. With few exceptions, the material reviewed is limited to relatively recent published items in the United States.

PB-235 567/5GA PC-GPO/MF$2.25-NTIS
Arkansas Univ., Fayetteville. Coll. of Engineering.
A TEST METHOD FOR VOLATILE COMPONENT STRIPPING OF WASTE WATER.
Environmental protection technology series,
Louis J. Thibodeaux. May 74, 140p W74-11801, EPA-660/2-74-044
Paper copy available from GPO.

Descriptors: *Water pollution control, *Industrial waste treatment, *Aeration, *Strippers, Desorption, Organic compounds, Cooling towers, Laboratory tests, Mass transfer, Waste water, Textile industry, Biochemical oxygen demand, Volatility, Gas chromatography, Alcohols, Food processing, Metal industry, Petroleum industry, Drug industry, Paper industry.
Identifiers: Chemical oxygen demand.

This work is concerned with the air-strippable volatile organic fraction of industrial wastewaters. The primary purpose was to develop laboratory apparatus and procedures that may be employed to assess the desirability of air-stripping in cooling towers as a treatment operation for removal of a portion of the organics from industrial wastewater. The apparatus developed consists of a short packed (Intalox Saddle) section with liquid recirculation and single pass countercurrent air flow. Desorption is performed in the apparatus at 25C and ambient pressure conditions. Samples were representative of: poultry, metal, oil-field, canning, pharmaceutical, paper, food, fibers, petroleum refinery and petrochemical industries. BOD, COD, TOC and gas chromatographic analysis were employed with the experiments. Industrial wastewaters were found to contain a non-volatile organic fraction that remains in the aqueous phase and a volatile organic fraction that can be transferred to the air phase. The net result of the desorption experiments is that some industrial wastewaters can be effectively treated by air-stripping a sizeable portion of the dissolved organics. (Modified author abstract)

PB-235 571/7GA PC-GPO/MF$2.25-NTIS
Environmental Protection Agency, Athens, Ga. Southeast Environmental Research Lab.
HERBICIDE RUNOFF FROM FOUR COASTAL PLAIN SOIL TYPES.
Environmental protection technology series,
G. W. Bailey, A. P. Barnett, W. R. Payne, Jr., and C. N. Smith. Apr 74, 109p W74-11805, EPA-660/2-74-017
Prepared by Southern Piedmont Conservation Research Center, Watkinsville, Ga.
Paper copy available from GPO.

Descriptors: *Herbicides, *Surface water runoff, *Soil properties, Water pollution, Drainage, Triazines, Benzonitrile, Sites, Cultivation, Slopes, Surface waters, Gas chromatography, Sediments, Identification, Coasts.
Identifiers: Triazine/chloro-ethylamino-isopropylamino, Atrazine, Benzonitrile/dichloro, Path of pollutants.

The movement of two herbicides in runoff and on sediment were studied as examples of pesticides in general use. Gas chromatography was used to determine the losses of atrazine (2-chloro-4-ethylamino-6-isopropylamino-s-triazine) and dichlobenil (2,6-dichlorobenzonitrile) from fallow plots on four Coastal Plain soil types following the application of about 13 cm (5 in.) of rainfall in two hours. The herbicides, as wettable powders, were surface-applied and incorporated. Simulated high intensity (a 100-year frequency storm) rainfall was started one hour after application. The greatest combined (runoff plus sediment) losses of atrazine in all soils and of dichlobenil in two soils occurred during the first 40-50 minutes of runoff. (Modified author abstract)

PB-235 588/1GA PC$3.75/MF$2.25
Waterloo Univ. (Ontario). Dept. of Chemical Engineering.
LABORATORY STUDY OF CONTINUOUS ELECTROOXIDATION OF DILUTE CYANIDE WASTES.
Final rept.,
J. J. Byerley, and K. Enns. Oct 74, 49p* EPA-670/2-74-059

Descriptors: *Industrial waste treatment, *Cyanides, *Water pollution control, Industrial wastes, Metal finishing, Electroplating, Electrochemistry, Oxidation.
Identifiers: *Electrooxidation, Heavy minerals.

Feasibility of detoxifying dilute cyanide plating wastes by electrooxidation was studied. Because of the toxicity of cyanide to aquatic and animal life and its detrimental effect on the operation of sewage treatment plants, in-plant treatment of dilute cyanide wastes is essential. An electrochemical demonstration unit was developed for the treatment of dilute cyanide plating wastes. The cyanide and plating metal concentrations can be reduced to less than 1 ppm.

PB-235 592/3GA PC$3.75/MF$2.25
Denver Urban Observatory, Colo.
CHARTER OF THE CITY AND COUNTY OF DENVER. FIRST REPORT. ELECTIONS - ELECTION COMMISSION TO THE CHARTER REVISION COMMITTEE.
Rept. no. 1 (Final).
Jan 74, 44p UO-LCCM-DEN-74-015-1
Contract HUD-H-987
Sponsored in part by National League of Cities, Washington, D.C. Prepared in cooperation with Denver Univ., Colo. and Colorado Univ., Boulder.

Descriptors: *Local government, *Elections, *Colorado, Revisions, Municipalities, Counties, Public opinion, Organizations, Personnel, Methodology, Regulations, Flexibility, Leadership, Expenditures.
Identifiers: *Charters, *Denver(Colorado), Qualifications, Violations, Responsibility, Local studies.

The report is the first of three dealing with a review of the Denver city charter. The report is concerned with elections and the elections commission. It is a working paper which outlines and discusses possible alterations and amendments to the elections and election commission section of the Denver charter. The other reports in the series deal with the Department of Health and Hospitals, the Department of Welfare, and Civil Service.

PB-235 676/4GA PC$4.75/MF$2.25
Ann Arbor Community Planning and Management, Mich.
COMMUNITY DEVELOPMENT SPECIAL REVENUE SHARING. A BACKGROUND PAPER.
Final rept.,
Joel D. Epstein. Mar 74, 81p

Descriptors: *Urban planning, *Community development, *Revenue sharing, *Michigan, Legislation, Planning, Citizen participation.
Identifiers: Local studies, *Ann Arbor(Michigan).

The objective of the project was to develop an effective planning process for expected community development revenue sharing legislation. The report describes, in part, a four-step planning process. The concept is innovative in that survey research is used to provide continuity for citizen involvement and is an attempt to insure that the community-at-large will have a voice in program development equal to any other organized part of the community. In addition, two other subject areas are covered. First is a summary of the three legislative proposals for community development revenue sharing being considered by the Congress as of September, 1973. Second is a summary of all Federal and state assisted programs in which the city of Ann Arbor has participated.

PB-235 691/3GA PC$4.25/MF$2.25
Little (Arthur D.), Inc., Cambridge, Mass.
ECONOMIC ANALYSIS OF EFFLUENT GUIDELINES RUBBER PROCESSING INDUSTRY.
Final rept.,
John T. Howarth, John A. Carter, and Kenneth R. Sidman. Aug 74, 56p* ADL-C-75916 EPA-230/2-74-024
Contract EPA-68-01-1541

Descriptors: *Water pollution, *Rubber industry, *Economic analysis, Cost analysis, Prices, Butyl rubber, Tires, Tire tubes, Synthetic elastomers, Latex, Investments, Operating costs, Requirements.
Identifiers: *Water pollution abatement.

An initial analysis of the economic impact of proposed water effluent guidelines upon the rubber processing industry was performed, based on the abatement cost data supplied by EPA. On this basis, with better than 88% coverage of the industry, none of the plants appears to be severely affected in meeting either the Best Practical Technology (BPT) or Best Available Technology (BAT) requirements. For the synthetic rubber segment, capital investment for pollution control will be an estimated $23 million through 1977, and $10 million from 1977 through 1983. Annual operating costs will be $8 million higher through 1977, and $4 million higher from 1977 through 1983. The tire and tube segment will meet both BAT and BPT in one step; investment will be an estimated $32 million, and annual operating costs will be roughly $13 million higher through 1977. The impact on prices will be no greater than 1.5% for BPT and BAT for the synthetic rubber segment, and about 0.45% for the tire and tube segment.

PB-235 701/0GA PC$6.25/MF$2.25
Washington Environmental Research Center, D.C. Economic Analysis Branch.
THE ECONOMIC DAMAGES OF AIR POLLUTION.
Socioeconomic environmental studies series,
Thomas E. Waddell. May 74, 169p* EPA-600/5-74-012 W74-11798
Paper copy also available from GPO PC$1.95.

Descriptors: *Economic effects, Air pollution, Damage, Benefit cost analysis, Estimates, Property values, Esthetics, Public health, Economic factors, Sources, Losses, Vegetation, Plants(Botany), Assessments, Materials, Decision making, Economic models.
Identifiers: *Air pollution effects(Humans), *Air pollution effects(Plants), *Air pollution effects(Materials), *Air pollution economics.

Air pollution is a problem because it endangers man's health and the environment in which he lives. The information researched in this report indicates that the cost of air pollution damage in 1970 (for measured effects only) falls within a range of $6.1 to $18.5 billion, with a 'best' estimate of $12.3 billion. A benefit-cost analytical framework for environmental decision-making is outlined. The methods that have been or can be used to estimate the damages of air pollution are identified. The strengths and weaknesses of each method are discussed. The technical coefficients method is utilized in estimating the value of air pollution damage to human health, to man-made materials, and to vegetation. A particular market study method, the property value approach, was used to estimate aesthetic and soiling-related costs. Damages are allocated by major pollutant andsource category.

PB-235 707/7GA PC$4.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Urban Systems Lab.
THE DOT NATIONAL COUNTY COMPONENT CONVERTER FILE: PROSPECTS, PROBLEMS FEASIBILITY.
Final rept., Dec 73-Apr 74,
Pamela Werner. Aug 74, 57p DOT-TSC-OST-74-17
Contract DOT-TSC-692

Descriptors: *County planning, *Data processing, *Geographic divisions, *Data files, Feasibility, Factor analysis, Methodology, Project planning, Components, Computer programming.
Identifiers: *Geocoding.

A systematic review of factors affecting the feasibility of developing a county component geocoding converter file is made. A discussion of the staged evaluation of such a file is presented.

PB-235 716/8GA PC$4.75/MF$2.25
Washington Environmental Research Center, D.C. Economic Analysis Branch.
ECONOMIC DAMAGES TO HOUSEHOLD ITEMS FROM WATER SUPPLY USE.
Socioeconomic environmental studies series,
Dennis P. Tihansky. Jul 73, 97p* EPA-600/5-73-001
Paper copy also available from GPO PC$1.30.

Descriptors: *Water supply, *Economic impact, *Chemical attack, Damage, Household goods, Service life, Water quality, Corrosion, Losses, Socioeconomic conditions, Cost estimates, Mathematical models, Benefit cost analysis, Computer programs.
Identifiers: Appliances, Domestic water, Water utilization.

Household appliances and personal items in contact with water supply are subject to physical damages from chemical and other constituents of the water. This study translates these damages into economic losses for a typical household. Then it aggregates these losses at the national and individual state levels. To do so requires several stages of analysis. First, the types of physical damages expected and associated water quality determinants are identified. The physical effects are next translated into economic losses. Second, damage functions are formulated to predict likely impacts of water quality changes on each household unit affected. Third, a computer program based on these functions is designed to estimate total damages per typical household and to aggregate them over selected regions. Finally, the program is applied to state-to-state data on water supply sources and socioeconoomic descriptors. Total damages to U.S. residents in 1970 are estimated in the range, $0.65-$3.45 billion, with a mean of $1.75 billion. The mean translates into $8.60 per person. States contributing most to total damages are California ($230 million) and Illinois ($164 million). (Modified author abstract)

PB-235 717/6GA PC$12.00/MF$2.25
Seattle Metropolitan Municipality, Wash.
COMPUTER MANAGEMENT OF A COMBINED SEWER SYSTEM.
Environmental protection technology series,
Curtis P. Leiser. Jul 74, 483p* W74-12003, EPA-670/2-74-022
Paper copy also available from GPO $5.30.

Descriptors: *Combined sewers, *Control equipment, *Surface water runoff, *Water pollution, Computers, Remote control, Overflows, Operating costs, Telemetry, Sewage treatment, Flow control, Systems management, Water quality, Benefit cost analysis, Washington(State).
Identifiers: *Storm water runoff.

At the conclusion of a ten-year construction program which affected much of Seattle's combined sewer system, a computer-controlled 'total systems management' complex was proposed, funded and constructed. Computer augmented treatment and disposal (CATAD) takes advantage of storage in the sewers to limit overflows, and selects overflow points based on water quality data. Since the control system began operating in 1971, receiving water quality, especially dissolved oxygen and coliform levels, has shown significant improvement; overflow volume has decreased by 50 to 60% during supervisory control and in excess of 90% during three months of limited automatic control. Eight pollution loading parameters were measured and found to be 68% less than before advanced control techniques. Capital costs totaled $2.6 million for the control system. (Modified author abstract)

PB-235 718/4GA PC$5.75/MF$2.25
Idaho Dept. of Environmental and Community Services, Boise.
IDAHO SOLID WASTE MANAGEMENT INDUSTRIAL SURVEY REPORT.
Jun 73, 128p IDECS-74/01
Grant RO1-EC-00015

Descriptors: *Solid waste disposal, *Industrial wastes, *Idaho, Industrial waste treatment, Management planning, Reclamation, Collection, Storage, Earth fills, Textile industry, Food processing, Paper industry, Wood wastes.
Identifiers: *Waste recycling, Sanitary landfills.

An industrial solid waste survey was conducted to compile information on the types and amounts of solid waste generated and the solid waste management techniques employed by Idaho's manufacturing industries. The survey was conducted using personal interviews. The conversion of municipal, county, and company-owned dumps to sanitary landfills will alleviate the majority of unacceptable solid waste practices. In some instances, collection and storage practices should also be updated. A comprehensive company-wide analysis and restructuring of the companies' existing solid waste practices should prove to be economically beneficial as well as helping to project a progressive company image. A well developed, comprehensive recycling plan at all levels appears to be the ultimate answer to the growing solid waste problem. (Modified author abstract)

PB-235 735/8GA PC$3.25/MF$2.25
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Quality Planning and Standards.
COMPILATION OF AIR POLLUTANT EMISSION FACTORS. SECOND EDITION. SUPPLEMENT NO. 2.
Sep 73, 21p AP-42-Suppl-2
See also Supplement 1, PB-231 170; and Supplement 3, PB-235 736.

Descriptors: *Air pollution, Passenger vehicles, Exhaust gases, Internal combustion engines, Diesel engines, Particles, Sulfur dioxide, Nitrogen oxides, Carbon monoxide, Deterioration.
Identifiers: *Emission factors.

The report is a supplement for 'Compilation of Air Pollutant Emission Factors', AP-42. The scope of the second edition has been broadened to reflect expanding knowledge of emissions. The titles of the specific sections which are included in this supplement No. 2 are as follows: Introduction; average emission factors for highway vehicles; and light-duty, gasoline-powered vehicles. The supplement contains average emission factors for carbon monoxide, hydrocarbons (crankcase and evaporation and exhaust), nitrogen oxides, particulates and sulfur oxides.

PB-235 736/6GA PC$4.25/MF$2.25
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Quality Planning and Standards.
COMPILATION OF AIR POLLUTANT EMISSION FACTORS. SECOND EDITION. SUPPLEMENT NO. 3.
May 74, 55p AP-42-Suppl-3
See also Supplement 2, PB-235 735.

Descriptors: *Air pollution, Emission, Combustion products, Bituminous coal, Anthracite coal, Exhaust gases, Fuel oil, Natural gas, Wood wastes, Combustion, Incinerators, Waste disposal, Liquified petroleum gases, Internal combustion engines, Petroleum, Smelting, Coking, Chemical industry, Fertilizers, Heating, Manufacturing.
Identifiers: *Emission factors.

The report is a supplement for Compilation of Air Pollutant Emission Factors, AP-42. The scope of this second edition has been broadened to reflect expanding knowledge of emissions. The topics covered are Natural gas combustion, liquified petroleum gas consumption, wood/bark waste combustion in boilers, sewage sludge incineration, lead smelting, secondary lead smelting, chemical wood pulping, pulpboard, and plywood veneer and layout operations.

PB-235 751/5GA PC$3.75/MF$2.25
Southwest Research Inst., San Antonio, Tex. Vehicle Emissions Research Lab.
EXHAUST EMISSIONS FROM UNCONTROLLED VEHICLES AND RELATED EQUIPMENT USING INTERNAL COMBUSTION ENGINES: PART 6. GAS TURBINE ELECTRIC UTILITY POWER PLANTS.
Charles T. Hare, and Karl J. Springer. Feb 74, 41p
SwRI-AR-940 APTD-1495
Contract EPA-70-108
See also Part 5, PB-232 507.

Descriptors: *Exhaust gases, *Gas turbine power generation, *Air pollution, Gas turbine engines, Public utilities, Hydrocarbons, Carbon monoxide, Nitrogen oxides, Carbon dioxide, Smoke, Oxygen, Sulfoxides, Measurement, Tables(Data).
Identifiers: *Gas turbine electric engines, *Emission factors.

The report includes summaries of test data and discussion on emissions from a number of gas turbine electric utility engines. It also covers the estimation of emission factors and national air quality impact of these engines. A regional estimate of the distribution of these emissions is also made. The

data are based on work performed by other agencies and groups. The measurements were made by a variety of techniques and included HC, CO, NOx, and sometimes particulate and SOx.

PB-235 783/8GA PC$5.25/MF$2.25
Hydronautics, Inc., Laurel, Md.
REVIEW OF THE ENGINEERING ASPECTS OF POWER PLANT DISCHARGES.
Technical rept. (Final),
S. J. Daugard, and T. R. Sundaram. Oct 73, 115p*
TR-7316-1 PPSP-MP-12
Grant EPA-R-801433

Descriptors: *Thermal pollution, *Industrial waste treatment, *Electric power plants, *Water pollution control, Reviews, Inventories, Cooling water, Boilers, Thermal power plants, Cooling systems, Maryland, Thermoelectric power generation, Waste disposal, Trade offs, Improvements.

A necessary prerequisite to making assessments of the ecological impact of power plant discharges is a delineation of the engineering factors affecting these discharges. The report describes a comprehensive inventory of discharges and treatment techniques of fifteen fossil-fueled power plants in the Maryland region. The inventory covers thermal effluents, chemical discharges from cooling and boiler water treatment systems as well as discharges from auxiliary systems. The acquired data are used to assess various control strategies and trade-offs. The improvements required in the state-of-the-art are also given.

PB-235 796/0GA PC$4.25/MF$2.25
California Univ., Davis. Dept. of Agricultural Engineering.
STUDY OF ABATEMENT METHODS AND METEOROLOGICAL CONDITIONS FOR OPTIMUM DISPERSION OF PARTICULATES FROM FIELD BURNING OF RICE STRAW. SPRING OPEN FIELD BURNING TRIALS.
Final rept.,
John R. Goss, and George E. Miller, Jr. 30 Jun 73, 51p ARB-R-2113-73-11

Descriptors: *Air pollution, *Agricultural wastes, *Combustion products, Rice plants, Residues, Meteorological data, Incinerators, Particle size, Ignition, Simulation, Moisture, Particles, Cost estimates, Combustion.

The project was initiated to obtain information on the effect of meteorological conditions and management techniques on particulate emissions from spring open field burning of rice field residue. Two fire management practices were employed: single line backfire, and single line headfire. Three residue management techniques were studied: spred straw, windrowed straw, and raked spread straw. In addition, measurements were taken of air temperature, relative humidity, absolute humidity, wind speed and direction, residue moistgure content, residue loading, fire temperature, rate of flame spread, CO2 emission, particulate production and particulate size distribution. The data analysis showed that particulate emissions could be minimized by burning at low moisture contents and using a backfire instead of a headfire ignition technique. Laboratory simulations confirmed the advantages.

PB-235 824/0GA PC$3.75/MF$2.25
Tennessee Univ., Knoxville. Water Resources Research Center.
RECLAMATION OF WATER FOR REUSE IN CHANNEL CATFISH RACEWAY SYSTEMS.
Research rept.,
Bill A. Simco. 28 Aug 74, 35p 39 W74-12203,
OWRR-B-028-TENN(1)
Contract DI-14-31-0001-4127

Descriptors: *Catfishes, *Fish raceways, *Water reuse, Circulation, Water reclamation, Aquaculture, Management, Flow rate, Water quality, Filter materials, Water flow, Fisheries, Design, Fresh water fishes.
Identifiers: *Recirculated water.

Channel catfish can be cultured at high densities in carefully managed recirculating raceway systems. Various flow rates, exchange rates, and tank to filter ratios were investigated in eleven recirculating systems employing biological filters, settling chambers and foam strippers. Limestone, shells, styrofoam and teflon rings served as effective filter media, but coal slag restricted water flow and was not satisfactory. An equation was developed to evaluate the effects of system design on water quality. Water quality varies directly with fresh water exchange, flow rate per tank, and the filter size. Production was greater in systems with small tanks and large filters than in systems with large tanks and small filters. Densities in excess of 7 lb/cu ft per tank have been obtained, indicating recirculating systems may become an increasingly important method of fish culture.

PB-235 871/1GA PC$7.50/MF$2.25
Olson Labs., Inc., Anaheim, Calif.
EVAPORATIVE EMISSION DEVICE RETROFIT STUDY.
Final rept. Jul 73-30 Apr 74.
Dec 73, 235p ARB-R-2-1372-73-16

Descriptors: *Air pollution control equipment, Trucks, Automobiles, Hydrocarbons, Crank case fumes, Fuel tanks, Carburetors, Emission, Exhaust gases, Feasibility, Cost estimates, Cost effectiveness.
Identifiers: *Retrofit devices.

Technical and economic feasibility of retrofitting or otherwise modifying evaporative uncontrolled, pre-1970 light and heavy-duty vehicles with devices, systems, and concepts similar to those used on the production 1970-1973 model light-duty vehicles are examined. The study evaluates and cost-estimates fuel tank modifications, carburetor modifications, and combinations of these two basic modifications.

PB-235 884/4GA PC$4.75/MF$2.25
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
GEOHYDROLOGIC RELATIONSHIPS IN WATER POLLUTION. TRAINING MANUAL.
Final rept.,
John R. Hyland. Jul 74, 98p* EPA-430/1-74-006

Descriptors: *Water pollution, *Hydrogeology, *Ground water, Manuals, Aquifers, Water wells, Ground water recharge, Stratigraphy, Bacteria, Water quality, Soil water, Geophysical prospecting, Water supply.
Identifiers: *Groundwater movement, *Water requirements.

The report presents a course manual which outlines concerning groundwater quality control. Topics included are: principles of geology, soils and groundwater hydrology, aquifer characteristics, technology of evaluating groundwater, geophysical applications, groundwater quality, pollution effects on groundwater and groundwater recharge. References are included on each topic.

PB-235 903/2GA PC$3.75/MF$2.25
Hawaii Univ., Honolulu. Water Resources Research Center.
SOME EVIDENCE OF ECONOMICS OF SCALE IN HAWAIIAN SUGAR PLANTATIONS.
Technical memo rept., 1 Jul 70-30 Jun 72,
James E. T. Moncur. Jan 74, 50p Tr-38 W74-12344,
OWRR-A-026-HI(1)
Contract DI-14-31-0001-3211

Descriptors: *Water supply, *Sugar industry, *Hawaii, Economic analysis, Sugar crops, Water consumption, Sugar refining, Water consumption, Regression analysis, Efficiency, Economic models, Scale(Ratio), Production, Linear programming, Oahu Island.
Identifiers: Water utilization.

Of the major sectors in Oahu's economy, sugar growing and milling together use by far the largest quantities of water. The three plantations still operating on Oahu in 1971 accounted for 57 percent of total withdrawals, even though this percentage has steadily declined over the past decade or longer. A persistent trend among plantations, moreover, is for mergers to occur, presumably to take advantage of economics of scale. Effect of scale on sugar production is evaluated. Data for plantations on four of the Hawaiian Islands are applied in several procedures for estimating scale economics and economic efficiency.

PB-235 912/3GA PC$3.75/MF$2.25
New Hampshire Univ., Durham. Water Resources Research Center.
FEASIBILITY STUDY TO DEVELOP GUIDELINES FOR LAKE AND RELATED LAND RESOURCE USE DEVELOPMENT RESEARCH OR ECONOMIC AND ECOLOGICAL IMPACT OF VARIOUS FORMS OF LAKE DEVELOPMENT.
Completion rept.,
Richard A. Andrews. 1974, 38p W74,-12350,
OWRR-A-036-NH(1)
Contract DI-14-31-0001-4029

Descriptors: *Water resources, *Lakes, *Land development, *Recreational facilities, Economic impact, Land use, Ecology, Feasibility, Water quality, Marinas, Septic tanks, New Hampshire.
Identifiers: Water quality data.

Many New Hampshire lakes are rapidly being developed, mainly for recreational purposes. The vacation cottage or second home is a major, but not the only, kind of development taking place. Concern over type and kind of development began in the late 1960s and early 1970s. The study investigated research approaches to answer numerous questions relating to guiding lake development. An attempt was made to develop an interdisciplinary project to analyze the impacts of alternative futures for lake and related land resources. Officially, New Hampshire does not have polluted lakes. A wide range of current development found on lakes is discussed and oriented to historical development patterns, access and distance from large population centers. A brief review of the literature revealed some mixed results in terms of physical and economic impact on an area. Marinas and septic tanks may have helped maintain the quality of some lakes.

PB-235 925/5GA PC$3.75/MF$2.25
Rhode Island Univ., Kingston. Dept. of Chemical Engineering.
TREATMENT OF WASTEWATER FROM FISH AND SHELLFISH PROCESSING PLANTS.
Final rept. 1 Jul 72-30 Jun 74,
Harold N. Knickle. 31 Jul 74, 38p W74-12346,
OWRR-A-048-RI(1)
Contract DI-14-31-0001-3840

Descriptors: *Industrial waste treatment, *Fish industry, *Food processing industries, Shellfish, Waste water, Filtration, Effectiveness, Osmosis, Adsorption, Precipitation(Chemistry), Economic factors, Water pollution control.
Identifiers: *Fish processing industry, Reverse osmosis.

Some of the simpler methods for treating liquid effluent from fish and shellfish processing plants have been studied with particular emphasis on their effectiveness and economy. These include filtration, reverse osmosis, adsorption, and chemical precipitation. In addition, the wastewater from an operating shellfish plant has been characterized. Filtration and chemical precipitation both appear to be effective and economical treatment methods.

PB-235 929/7GA PC-GPO/MF$2.25/NTIS
Robert S. Kerr Environmental Research Lab., Ada, Okla.

AN EVALUATION OF TAILINGS PONDS SEALANTS.
Environmental Protection technology series,
Don A. Clark, and James E. Moyer. Jun 74, 35p
W74-12217, EPA-660/2-74-065
Paper copy available from GPO.

Descriptors: *Linings, *Ponds, *Tailings, *Mine waters, Waste disposal, Sealers, Membranes, Soil compacting, Permeability, Clay soils, Seepage, Monitors, Cost estimates, Fiberglass reinforced plastics, Chloroprene resins, Polyvinyl chloride, Latex.
Identifiers: *Mine wastes.

A summary is presented of the rather limited information available in the literature pertaining to the use of sealants for mine and mill tailings ponds. Included is a discussion of currently employed seepage detection methods, as well as the various types of sealants currently in use–compacted earth, clays, chemicals, waste tailings solids, asphalt, and synthetic membranes. Only properly installed synthetic liners will prevent all seepage. Installation costs of the sealants, including labor, are discussed and graphs for estimating costs based on pond size are presented. Regulations governing the amount of seepage allowed are ill-defined or non-existent in the majority of states.

PB-235 931/3GA PC-GPO/MF$2.25-NTIS
Alabama A and M Coll., Normal.
NITROGEN AND PHOSPHORUS LOSSES FROM AGRONOMY PLOTS IN NORTH ALABAMA.
Environmental Protection technology series,
Robert R. Bradford. Apr 74, 49p W74-12221, EPA-660/2-74-033
Grant EPA-R-800401
Paper copy available from GPO.

Descriptors: *Water pollution control, *Agricultural wastes, *Farm crops, Surface water runoff, Fertilizers, Nutrients, Soils, Inorganic nitrates, Inorganic phosphates, Sediments, Agronomy, Silts, Water quality, Ureas, Corn plants, Cotton plants, Grain crops.

A study of nitrogen and phosphorus losses from Decatur silt loam soil was conducted over three cropping periods from 1969-1972. Experimental agronomy plots were seeded to cotton, corn, soybeans, and millet and compared with uncropped and unfertilized check plots. The effects of these crops on nitrogen losses - total nitrogen, nitrate-nitrogen, and ammonium-nitrogen (for 1971-1972 only) - and phosphorus losses were evaluated. Average total rainfall and losses of sediment and runoff were also determined.

PB-235 948/7GA PC$5.25/MF$2.25
Transportation Research Board, Washington, D.C.
URBAN BGOODS MOVEMENT.
1974, 122p* TRB-TRR-496, ISBN-O-309-02286-X
Library of Congress Catalog Card no. 74-15439.

Descriptors: *Cargo transportation, *Urban transportation, Transportation methods, Transportation management, Transportation planning, Transportation terminals, Regional planning, Research.

Contents: Estimating urban goods movement demands; Consolidation of urban goods movements: A critical analysis; Forecasting urban truck trips in the United Kingdom; The role of terminal consolidation in urban goods distribution; Toward a unified distribution system-warehouse location theory; Measurement of urban commodity movements; A framework for the analysis of demand for urban goods movements; Environmental impact of goods movement activity in New York City; Canadian studies of urban goods movement-a status report; Basic data needs for urban goods movement analysis; Some fallacies in urban goods movement; Can regional planning improve truck transportation.

PB-235 995/8GA PC$3.75/MF$2.25
Mitre Corp., McLean, Va.
THE HADDONFIELD DIAL-A-RIDE DEMONSTRATION: DEMOGRAPHIC, SYSTEM AND USER CHARACTERISTICS,
Douglas Medville, and Bert Arrillaga. Mar 74, 35p
M73-228-Rev-1 UMTA-VA-06-0012-74-4
Contract DOT-UT-10028

Descriptors: *Urban transportation, *Transporation development, New Jersey, Surveys, Tables(Data), Transit riders, Routes, Services, Transportation planning.
Identifiers: Dial a ride systems, *Haddonfield(New Jersey).

Data concerning the Dial-A-Ride demonstration in the Haddonfield, New Jersey area are presented in tabular and graphical form. The tables and graphs summarize the major characteristics of the area served, the attributes of the services provided and the characteristics of Dial-A-Ride users. Where it is possible to do so, comparisons are provided between the characteristics of the Dial-A-Ride users and those of the entire area served. The information was obtained from household surveys, trip ticket data, and on-board surveys.

PB-236 026/1GA PC$8.75/MF$2.25
Alabama Development Office, Montgomery.
A SELECTED BIBLIOGRAPHY OF ALABAMA COUNTY AND REGIONAL PLANNING AND DEVELOPMENT DOCUMENTS. REVISED EDITION, 1974.
Final rept.,
Mark P. Worsham. 1974, 279p ALA-ADO-X996-1042-10
Supersedes PB-207 709.

Descriptors: *Regional planning, *Bibliographies, *Alabama, Economic development, Education, State government, Health, Housing studies, Natural resources, Culture(Social sciences), Safety, Consumer protection, Social conditions.

The purpose of the bibliography is to present a comprehensive view of the planning and development processes that have taken place for Alabama's county and regional planning areas. In general, this book is directed to those persons interested and concerned with planning and development in Alabama and its attendant range of social and economic problems. The style has been chosen to communicate with professional planners, and the treatment has been broad, indicated by the plus 1300 documents listed in the bibliography.

PB-236 044/4GA PC$4.25/MF$2.25
Pennsylvania State Univ., University Park. Inst. for Research on Land and Water Resources.
WATER PRICING DURING URBAN DEVELOPMENT.
Research publication,
Frank M. Goode. Jun 74, 67p Research Pub-81
W74-12366, OWRR-B-033-PA(1)
Contract DI-14-31-0001-3326

Descriptors: *Water supply, *Prices, *Public utilities, Municipalities, Operating costs, Maintenance, Estimates, Financing, Water wells, Construction, Payment, Bond financing, Urban development, Water economy, Economic models.
Identifiers: Water costs.

The objective of the report is to determine if water payments by new users are sufficient to pay for the operation and maintenance costs as well as costs associated with developing a new well field. A model was developed to simulate future system growth. This model generated estimates of the amount of new users' payments available each year to pay for the construction of the new wells. Comparing these estimates to the principal and interest payments on the bond issue which financed the well construction gave an indication of whether or not new users paid for the new wells. Also, information was developed on the related question of extent to which various types of new users pay for the new wells.

TT-72-54022/1 PC$4.75
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 5, NUMBER 1, 1971.
1974, 88p
Trans. of Ochrona Powietrza (Poland) v5 n1(21) 1971, by A. Szafranski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Air pollution, Translations, Poland, Dust control, Dust collectors, Sulfur dioxide, Odors, Asbestos, Nicotine, Nitrogen oxides, Carbon dioxide, Carbon monoxides, Reviews, Occupational diseases.

Articles dealing with various aspects of air pollution and its control are presented. Topic areas cover applications of coagulation in dust collection technology, characteristics of industrial odors, emissions of dust and sulfur dioxide from a steelworks blast-furnace plant, asbestos and other substances in human lungs, determination of nicotine in air, and effect of motor traffic density on air pollution.

UCRL-51588 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
INTERAGENCY CONFERENCE ON THE ENVIRONMENT: A POST-CONFERENCE SURVEY.
11 Jun 74, 16p
Contract W-7405-eng-48

Descriptors: (*Environment, *Coordinated research programs), Environmental protection agency, Meetings, Nasa, Us aec.

For abstract, see NSA 30 08, number 21044.

13C. Construction Equipment Materials, and Supplies

AD-785 592/7GA PC$7.00/MF$2.25
Lockheed Propulsion Co Redlands Calif
ROLL OVER PROTECTIVE STRUCTURE (ROPS) DESIGN, ANALYSIS, AND TEST FOR CATERPILLAR 830MB AND CLARK 290M MEDIUM WHEELED TRACTORS. VOLUME I.
Final rept. Jul 72-Jul 74,
G. R. Gavan, and S. A. De Martinis. 1 Jul 74, 179p
Rept no. LPC-684-F-2-Vol-1
Contract DAAK02-72-C-0574
See also report dated 15 Jan 74, AD-774 303 and Volume 2, AD-785 593.

Descriptors: *Earth handling equipment, *Protective equipment, *Military vehicles, Field tests, Installation, Protection, Roll, Military requirements, Fabrication, Structural properties, Specifications, Vibration, Tractors.
Identifiers: *ROPS(Roll Over Protective Structures), *Roll over protective structures.

Roll Over Protective Structures (ROPS) have been analyzed and designed for the Clark 290M and CAT 830MB tractors. These ROPS are of a two-post type to best comply with attachment limitations on the vehicles and provide minimum obstruction to visibility and vehicle operation. ROPS are removable and interchangeable between the two tractors. Certification tests to SAE Recommended Practices were performed and a field roll-over test was conducted on the CAT 830MB. Installation instructions for retrofit of the ROPS onto tractors now in the field are included. Complete design descriptions of the ROPS are shown including Material and Process Specifications for steel to be used in ROPS fabrication.

Structural analysis of the designs and of test results are shown. Vibration analysis of the ROPS is included as are noise and vibration data taken on the vehicle during various operational modes. (Author)

AD-785 593/5GA PC$10.00/MF$2.25
Lockheed Propulsion Co Redlands Calif
ROLL OVER PROTECTIVE STRUCTURE (ROPS) DESIGN, ANALYSIS, AND TEST FOR CATERPILLAR 830MB AND CLARK 290M MEDIUM WHEELED TRACTORS. VOLUME II.
Final rept. Jul 72-Jul 74,
G. R. Gavan, and S. A. De Martinis. 1 Jul 74, 374p
Rept no. LPC-684-F-2-Vol-2
Contract DAAK02-72-C-0574
See also Volume 1, AD-785 592 and report dated Aug 74, AD-785 594.

Descriptors: *Earth handling equipment, *Protective equipment, *Military vehicles, Field tests, Installation, Protection, Roll, Military vehicles, Tractors, Specifications, Structural properties, Vibration.
Identifiers: *ROPS(Roll Over Protective Structures), *Roll over protective structures.

Contents: Material and process specifications; Structural analysis of prototype hardware for Caterpillar 830MB; Certification test results for Caterpillar 830MB; Roll test data for Caterpillar 830MB; Structural analysis of prototype hardware for Clark 290M; Certification test results for Clark 290M; Installation instructions for Clark 290M.

AD-785 594/3GA PC$4.75/MF$2.25
Lockheed Propulsion Co Redlands Calif
ROLL OVER PROTECTIVE STRUCTURE (ROPS) FOR THE ALLIS CHALMERS 645M MILITARY FRONT END LOADER.
Final rept.,
S. A. De Martinis. Aug 74, 91p Rept no. LPC-684-F-3
Contract DAAK02-72-C-0574
See also report dated 1 Jul 74, AD-785 593.

Descriptors: *Earth handling equipment, *Protective equipment, *Military vehicles, Field tests, Installation, Military requirements, Protection, Roll.
Identifiers: *ROPS(Roll Over Protective Structures), *Roll over protective structures.

Two commercial Roll Over Protective Structures (ROPS) have been identified which are suitable for retrofit onto military Allis Chalmers 645M Front End Loaders and are compliant with SAE Practice J394a. One of the ROPS was designed to avoid relocation of equipment installed on the military vehicle. Test Report to show compliance of this ROPS with SAE requirements is included as are installation times and installation procedures for both ROPS. (Author)

AD-785 595/0GA PC$3.75/MF$2.25
Manlabs Inc Cambridge Mass
NOISE ABATEMENT AND INTERNAL VIBRATIONAL ABSORPTION IN POTENTIAL STRUCTURAL MATERIALS.
Semi-annual rept. 1 Dec 73-1 Jun 74,
S. A. Kulin, L. Kaufman, and P. P. Neshe. Aug 74, 45p AMMRC-CTR-74-53
Contract DAAG46-74-C-0048, ARPA Order-2555

Descriptors: *Structures, *Noise reduction, Materials, Damping, Structural mechanics, Vibration, Transformations, Magnetostriction, Nickel alloys, Iron alloys.

The damping capacity of NiTi, Cu-Al-Ni and Fe-Pt alloys is being studied as a function of temperature above and below Ms. Measurements of heat capacity and transformation characteristics have been completed for NiTi and one Fe-Pt alloy and are in progress for a second Fe-Pt alloy and the Cu-Al-Ni alloy. Mechanical property measurements and assessment of the effects of elastic and plastic strains on the characteristics of the Ni-Ti alloy are in progress. The transformation in NiTi alloys is thermoelastic. A plastic deformation can be employed to alter the transformation characteristics. (Modified author abstract)

AD-785 748/5GA PC$3.75/MF$2.25
Trinity Coll Dublin (Ireland) School of Engineering
INVESTIGATION OF STRESS CONCENTRATION IN REINFORCED CONCRETE COMPONENTS.
Final technical rept. 1 Jun 73-31 May 74,
T. E. Glynn, and M. Z. Al-Salihi. Jun 74, 26p
Grant DA-ERO-591-73-G-0041

Descriptors: *Reinforced concrete, *Stresses, Static tests, Dynamic tests, Crack propagation, Formulations, Ireland.
Identifiers: *Ferrocement.

This report is a continuation of the former efforts to elucidate the behavior of ferrocement concrete in static and dynamic stress fields. The influence of various reinforcements on pre and post cracking of thin sections forms the main topic of this report. The objects of the testing program were to compare the effectiveness of various steel mesh configurations in arresting crack propagation in stressed members; to provide experimental data for checking theoretical predictions of strength based on material parameters; to identify areas of future research potential. The work to date has been devoted to flexural and direct tensile tests on thin slabs. The slabs were reinforced uniformly with steel meshes of various patterns. The matrix consisted of microconcretes, and some variations in the mix design were incorporated.

AD-786 015/8GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE CRACKING RESISTANCE OF PRESTRESSED POLYMER CEMENT CONCRETE BEAMS,
V. I. Vaitkyavichius, and A. Kudzys. 26 Aug 74, 17p Rept no. FTD-HC-23-1960-74
Edited trans. of Vilnyusski Inzherno-Stroitelnyi Institut. Trudy (USSR) n5 p199-209 1973.

Descriptors: *Beams(Structural), *Prestressed concrete, *Cracking(Fracturing), Polymers, Additives, Epoxy resins, Mathematical models, Translations, USSR.
Identifiers: *Concrete polymer composites.

The purpose of this work was to investigate the crack resistance of prestressed beams made from three types of concrete mixtures with varying reinforcement prestressing and eccentricity. A mathematical scheme was used in analyzing the experimental values obtained for the moment of crack formation in beams in the least number of experimental samples and in analyzing quantative estimates of the effect of the addition of polymers on the size of the cracks.

AD-786 241/0GA PC$4.25/MF$2.25
Brown Univ Providence R I Dept of Engineering
APPROXIMATION TECHNIQUES FOR IMPULSIVE LOADING OF STRUCTURES OF TIME DEPENDENT PLASTIC BEHAVIOR WITH FINITE DEFLECTIONS.
Technical rept.,
P. S. Symonds, and C. T. Chon. Mar 74, 51p Rept no. TR-23
Contract N00014-67-A-0191-0003

Descriptors: *Impulse loading, *Plastic deformation, Approximation(Mathematics), Mathematical models, Steel, Titanium alloys, Structures.

Methods for estimating plastic deflections of impulsively loaded structures are described with emphasis on methods for rate dependent behavior which can be extended to problems of finite deflections. Two approaches are described, namely deflection bounds and the mode approximation technique. A constitutive law of homogeneous viscous type is used since this simplifies both approaches and is conservative. The authors illustrate fitting this representation to test data for mild steel and titanium alloys. A discrete two-mass model is used to illustrate the basic ideas. (Author)

PB-234 954/6GA PC$5.75/MF$2.25
Pennsylvania Dept. of Transportation, Harrisburg Bureau of Materials, Testing and Research.
SKID RESISTANCE STUDIES: AGGREGATE-SKID RESISTANCE RELATIONSHIPS AS APPLIED TO PENNSYLVANIA AGGREGATES.
Final rept. 1965-74,
Wade L. Gramling, and John G. Hopkins. May 74, 145p FHWA-RD-65-4

Descriptors: *Pavements, *Aggregates, *Skid resistance, Performance evaluation, Trafficability, Loads(Forces), Flexible pavements, Petrography, Texture, Particle size, Test methods, Pennsylvania, Highways, Seasonal Variations.

The skid resistance studies are concerned with these problems.: To what degree do the various aggregates tested contribute to the skid resistance properties of pavement; and what is the performance record of these aggregates when affected by traffic passes and seasonal changes. Research activities from 1960 to 1968 indicated skid resistance values on bituminous concrete pavements were governed primarily by coarse aggregate properties. In order to evaluate these aggregate parameters a series of test strips were planned and constructed in 1968-69 for periodic skid testing. The eleven test strips included a representative cross-section of the more than 340 sources producing aggregates for use in Pennsylvania. Petrographic analysis was made of the coarse aggregates used in the test strips and skid tests were conducted periodically at approximately one-month intervals throughout the study.

PB-235 848/9GA PC$8.75/MF$2.25
West Virginia Univ., Morgantown. Coal Research Bureau.
PRODUCTION OF FLYASH-BASED STRUCTURAL MATERIALS.
Final rept. Dec 65-Feb 72,
Charles F. Cockrell, Kenneth K. Humphreys, Joseph W. Leonard, Charles R. McFadden, and Harry E. Shafer, Jr. Jun 72, 283p OCR-69-F
Contract DI-14-01-0001-488
Paper copy also available from GPO PC$2.00 as Stock no. 2414-0044.

Descriptors: *Fly ash, *Construction materials, *Bricks, Manufacturing, Slags, Economic analysis, Sodium silicates, Electric power plants, Compressive strength, Moisture.
Identifiers: *Waste recycling.

This report describes bench-scale studies, pilot plant operations and process economics for the commercial production of structural materials. Raw materials used were flyash, bottom ash and boiler slag obtained from eastern, central and western coal areas. The work has demonstrated that most, if not all, types of ash produced from American coals can be made into construction products meeting or exceeding ASTM standards for superior-grade face brick. The flyash bricks differ from their clay counterparts in three significant ways: (1) being lighter, they cost less to transport have an improved market potential for high-rise construction, and are easier for masons to handle; (2) flyash structural forms are dimensionally precise and are therefore replaceable without change of shape or color; and (3) flyash structural forms can be expanded in size and shape with no warpage, size variation or surface defects.

PB-235 984/2GA PC$4.25/MF$2.25
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.

LABORATORY AND FIELD EVALUATION OF PLASTIC-COATED DOWEL BARS.
Interim rept. no. 3,
James E. Bryden, and Richard G. Phillips. Jul 74, 60p NYSDOT-ERD-74-RR-22, FHWA-45J1112

Descriptors: *Dowels, *Concrete pavements, *Plastic coatings, Corrosion resistance, Supports, Highways, Construction joints, Laboratory tests, Field tests, Steel.

Dowel bars coated with a 17-mil layer of polyethylene plastic over a 4-mil inner coating of asphalt mastic were laboratory-tested and also installed in five pavement test sites for evaluation of construction problems and long-term performance. In all, 90 laboratory pullout tests were conducted on specimens specially fabricated for study of different combinations of dowel lubricant, and condition, and alignment. Dowel pullout resistance was not greatly affected by misalignment. Plastic-coated dowels had far less pullout resistance than plain steel dowels; this resistance was also reduced by coating the dowels with oil or grease. While the tests and field evaluations have been generally favorable, several potential problems are noted: (1) slippage of the plastic coating may result in loss of corrosion protection, (2) fabricating the dowels into basket assemblies may cause coating damage or poor alignment, and (3) careful attention during construction is essential to assure proper alignment. (Modified author abstract)

PB-236 056/8GA PC$3.75/MF$2.25
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
FIELD STUDY OF A PREDEFLECTED STEEL-CONCRETE COMPOSITE BRIDGE.
Final rept.,
Donald M. Cronk, and H. Daniel Rogers, Jr. Aug 74, 26p NYSDOT-ERD-74-RR-23
See also PB-207 278.

Descriptors: *Bridge decks, *Reinforcing steels, *Deformation, Loads(Forces), Crack propagation, Creep, Design, Stresses.

Field tests were conducted on a skewed simple-span bridge to evaluate existing design standards for predeflected ('Preflex') steel-concrete composite beams. The test program consisted of mid-span vertical displacement (deflection) measurements of these beams under initial and long-term dead loads, and visual inspection of the concrete for crack development. The results of 2 years of observations are presented and compared to theoretical values. These results show that the structure's initial and long-term performance has been satisfactory. (Modified author abstract)

13D. Containers and Packaging

AD-785 917/6GA PC$5.75/MF$2.25
Presearch Inc Arlington Va
INFLUENCE OF SELECTED MODULAR CONTAINER DESIGNS (PALCON/TRICON) ON LKA-113 CLASS SHIP CARGO HANDLING AND STORAGE.
Final rept.,
Waverly E. Sykes, Martin B. Betts, Thomas E. Burt, and Joseph F. Toomey. 2 Jul 74, 140p Rept no. PI-TR-258
Contract N00024-73-C-5285

Descriptors: *Containers, *Cargo ships, *Amphibious operations, Merchant vessels, Containerizing, Compatibility, Naval vessels, Storage, Handling, Naval research.
Identifiers: Design, LKA 113 vessel.

Ship cargo loading profiles for the PALCON/TRICON designs and for palletized cargo are developed. Ship storage relationships are examined to determine differences in potential benefit. Using these loading profiles, LKA off-load performance is synthesized by computer simulation for palletized cargo and for two variations of PALCON/TRICON discharge. In the second stage, cargo discharge rates and the productivity of ship-to-shore transfer vehicles are examined. Cargo packaging is assessed in terms of its impact on the LKA's 'level of supply' and general unloading performance.

GEPP-132 PC$4.00/MF$2.25
General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
WELD DEFECT DETECTION BY ULTRASONIC AND X-RAY METHODS.
P. A. Fessler. 29 Jul 74, 15p
Contract AT(29-2)-656

Descriptors: (*Welded joints, *Ultrasonic testing), (*X-ray radiography, Welded joints), Comparative evaluations.

For abstract, see NSA 30 08, number 23443.

13E. Couplings, Fittings, Fasteners, and Joints

AD-786 027/3GA PC$3.75/MF$2.25
Air Force Materials Lab Wright-Patterson AFB Ohio
STRESS INTENSITY FACTORS FOR SOME THRU-CRACKED FASTENER HOLES,
Alten F. Grandt, Jr. Jul 74, 31p Rept no. AFML-TR-74-71

Descriptors: *Fastenings, *Holes(Openings), *Cracks, Loads(Forces), Crack propagation, Residual stress, Fatigue(Mechanics).
Identifiers: *Fracture mechanics.

A stress intensity factor solution is developed for a large plate containing radial hole cracks loaded with arbitrary crack face pressure. When the pressure is defined as the unflawed hoop stress surrounding a mechanical fastener, stress intensity factor calibrations are readily computed by the linear superposition principle. Results obtained in this manner agree well with previous solutions determined for open holes loaded in remote tension. The potential usefulness of the present analysis is further demonstrated with application to specific fastener configurations, including interference fit fasteners, pin-loaded plates, and cold-worked holes. (Author)

N74-29881/1GA PC$15.25/MF$2.25
Technische Universitaet, Hanover (West Germany).
PRODUCTION OF TUBULAR COUPLINGS FROM UNALLOYED STEEL AND ACID RESISTANT METALS BY HOT FORMING BEITRAG ZUR FERTIGUNG ROHRFOERMIGER VERBUNDKOERPER AUS UNLEGIERTEM STAHL UND SAEUREBESTAENDIGEN METALLEN DURCH WARMUMFORMUNG.
Ph.D. Thesis.
I. Moeller. 1972, 245p
Language in German.

Descriptors: *Cladding, *Hot working, *Production engineering, *Steel structures, Chromium, Corrosion resistance, Metal finishing, Metal-metal bonding, Nickel, Pipes (Tubes), Titanium.

For abstract, see STAR 1219

N74-30922/0GA PC$40.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PROCEEDINGS OF THE SYMPOSIUM ON WELDING, BONDING, AND FASTENING.
B. A. Stein, and J. D. Buckley. Dec 72, 743p
NASA-TM-X-70269
Conf-Proc. Held at Williamsburg, VA., 30 May - 1 Jun. 1972, Sponsored by NASA, George Wash. Univ., and AM. Soc. For Metals.

Descriptors: *Aircraft structures, *Conferences, *Fasteners, *Metal bonding, *Metal joints, *Spacecraft structures, *Welded joints, Adhesive bonding, Aluminum, Nondestructive tests, Production engineering, Quality control, Refractory metal alloys, Steels, Titanium.

For abstract, see STAR 1220

PAT-APPL-486 801 PC$3.25/MF$2.25
Department of the Air Force Washington D C
CABINET CLOSURE SYSTEM.
Patent application,
Heino L. Pull. Filed 9 Jul 74, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Closures, Patents, Electronic equipment, Containers, Electromagnetic shielding, Radiofrequency interference.
Identifiers: *Patent applications, PAT-CL-312-109.

The patent application describes a cabinet closure system capable of providing both mechanical rigidity and RFI shielding. The closure system has a U-shaped closure element which relies upon a wedging-lever action for securely holding equipment in place. Because of the novel makeup of the closure element, a minimum amount of fasteners are required to secure the closure element in the sealed or closed position. In this manner quick removal of and/or installation of equipment is possible.

13F. Ground Transportation Equipment

AD-785 658/6GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
A VEHICLE-ROAD COMPATIBILITY ANALYSIS AND MODIFICATION SYSTEM (VRCAMS). PART I AND II.
N. R. Murphy, Jr., and V. C. Barber. 1973, 16p

Descriptors: *Vehicles, *Roads, Compatibility, Interactions, Digital simulation, Mobility, Maintenance, Trafficability.
Identifiers: Vehicle road interactions, VRCAMS computer program.

VRCAMS is a first-generation, comprehensive, digital computer model for predicting the performance of vehicles and roads whose outputs can be combined for analysis. It is divided into five basic modules: mobility-ride dynamics, traffic volume/capacity, structural analysis, vehicle movement, and maintenance analysis. All five modules draw from a common data base consisting of two files, vehicle data and road data. The model has been documented in a technical report.

AD-785 883/0GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
GAZ-71 TRACKER TRANSPORTER,
V. Rogozhin, and Yu. Zamyshlyaev. 25 Jul 74, 6p
Rept no. FSTC-HT-23-1769-73
Trans. of Za Rulem (USSR) n2 p9-10 1973.

Descriptors: *Tracked vehicles, Terrain, Transportation, Armored personnel carriers, Mobility, Maneuverability, Translations, USSR.
Identifiers: GAS-71 vehicles(USSR).

AD-785 887/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
METHOD FOR DETERMINATION OF DESIGN PARAMETER FOR CORNERING LINKAGE OF SEMITRAILER WHEELS (1). EXPERIMENTAL

RESEARCH ON THE OPERATION OF STEERING LINKAGE (2),
N. I. Kryshen, V. A. Ilarionov, Ts. P. Merdzhanova, and S. P. Stoyanov. 10 Apr 74, 18p
Rept no. FSTC-HT-23-1465-73
Trans. of Avtomobilnaya Promyshlennost (USSR) n10 p19-22 1971.

Descriptors: *Semitrailers, *Steering, Vehicle wheels, Linkages, Kinematics, Trailers, Translations, USSR.

The report contains discussion of basic mathematical parameters of cornering a semitrailer with steerable wheels as related to the basic kinematic parameter. Major example given is cornering when tractor moves along a circular trajectory and semitrailer is still on the straightaway with subsequent conjugation. The second article discusses specific theoretical and practical kinematics of steering linkage in terms of cornering angles. A measuring device using electro-mechanical time and course sensors is used in test performed on a forklift truck. Measuring device described and test results given in bar graph and cumulative curve.

AD-785 935/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
SIMPLE UNIVERSAL JOINTS IN DRIVE AXLES OF UAZ VEHICLES,
E. Varchenko. 5 Mar 73, 7p Rept no. FSTC-HT-23-1311-73
Trans. of Avtomibilnyi Transport (USSR) n9 p38-39 1972.

Descriptors: *Passenger vehicles, *Metal joints, Axle shafts, Translations, Road tests, USSR.
Identifiers: UAZ vehicles, *Ball joints.

The article discusses tests conducted on UAZ motor vehicles, in which the driving front axle ball joints, which have a constant angular velocity, were replaced with simple universal joints, both ball type, and those built with crosses on needle bearings. Test results showed that when the front driving axle was properly used (i.e., not on hard, dry surfaces) the life of the parts and tire wear with the simple joints did not differ appreciably from those factors with the more complex constant speed joints.

AD-785 964/8GA PC$9.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
PARTS CATALOG FOR KRAZ-246, KRAZ-256B, KRAZ-257 AND KRAZ-258 TRUCKS.
28 Mar 74, 309p Rept no. FSTC-HT-23-1791-73
Trans. of mono. Katalog Detalei Automobilei KrAZ-256, 256B, 257, 258, Moscow, 1971 248p.

Descriptors: *Trucks, *Spare parts, *Catalogs, Translations, USSR.
Identifiers: KrAZ-256 vehicles(USSR), KrAZ 256B vehicles(USSR), KrAZ-257 vehicles(USSR), KrAZ-258 vehicles(USSR).

The catalog is a listing of all parts of the KrAZ-256, KrAZ-256B, KrAZ-257, and KrAZ-258 motor vehicles. It also contains technical characteristics of the vehicles and instruction for use of the catalog. The parts of the vehicles are broken down into gropus and subgroups.

AD-785 976/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
A PRODUCTION LINE DIAGNOSTIC STATION,
E. Korol. 26 Apr 74, 10p Rept no. FSTC-HT-23-65-74
Unedited trans. of Avtomobilnyi Transport (USSR) n3 p25-26 1973.

Descriptors: *Passenger vehicles, *Maintenance, Mechanical drawings, Automation, Translations, USSR.

A partially automated sequence of four production line testing stations is described. The four stations are in the final assembly stages and service some 17 types of automobiles. Drawings show the equipment layout at each of the stations and increases in labor productivity and financial savings are claimed.

AD-786 270/9GA PC$10.00/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
NEW DEVELOPMENTS IN THE MANUFACTURE OF TRUCKS,
N. S. Stepanchenko. Nov 73, 368p Rept no. FSTC-HT-23-197-73
Trans. of mono. Novoe v Proizvodnstve Gruzowykh Automobilei, Moscow, 1971 312p.

Descriptors: *Trucks, *Manufacturing, Vehicle chassis components, Casting, Pressing(Forming), Abrasion, Translations, Machining, USSR.

The collection presents problems in the improvement of technological processes in the manufacture of truck parts by means of casting, hot and cold stamping, rotary pressing, sizing (rolling) operations and vibration-abrasive treatment to remove flashs and sharps edges on the parts.

COM-74-11573/4GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
ELECTRIC AUTOMOBILES. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Sep 74,
Edward J. Lehmann. Oct 74, 76p* NTIS/WINN-74-082
Supersedes COM-74-10101.

Descriptors: *Electric automobiles, *Bibliographies, Storage batteries, Design, Cost estimates, Performance evaluation.
Identifiers: High energy batteries.

This bibliography contains 60 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. Included are studies of battery systems, costs, and evaluations of electric vehicles.

N74-31359/4GA PC$5.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ULTRASONIC MEASUREMENT OF STRESS IN RAILROAD WHEELS AND IN LONG LENGTHS OF WELDED RAIL.
W. N. Clotfelter, and E. R. Risch. Jul 74, 36p
NASA-TM-X-64863

Descriptors: *Rail transportation, *Rails, *Velocity measurement, *Wheel brakes, Failure modes, Nondestructive tests, Stresses, Vehicle wheels, Welded structures.

For abstract, see STAR 1220

PB-234 501/5GA PC$6.25/MF$2.25
International Harvester Co., Fort Wayne, Ind.
TRUCK NOISE IV-C: THE REDUCTION OF COOLING SYSTEM NOISE ON HEAVY DUTY DIESEL TRUCKS.
Rept. no. 3,
James T. Shrader, and W. H. Page. May 74, 157p
DOT-TST-74-22
Contract DOT-OS-20222

Descriptors: *Truck engines, *Cooling systems, *Noise reduction, Trucks, Diesel engines, Cooling fans, Cooling rate, Acoustic measurement.

One of the major noise sources on many motor trucks is the cooling fan. The ability of the cooling system to maintain adequate engine temperature is dependent on the performance of many components in addition to the fan. These components, which include the engine, the radiator, the fan shroud, the radiator shutters and the engine compartment, also influence the noise generation process. Using a systematic approach, each of these components was optimized to reduce the cooling system noise generated by the fan. The basic approach was to improve the cooling system efficiency, after which the improved cooling ability was traded for reduced noise by decreasing the fan speed. Using this approach, the cooling system noise level was reduced by nearly 20 dB(A) on the test vehicle with no loss in cooling ability.

PB-235 492/6GA PC$8.50/MF$2.25
Transportation Systems Center, Cambridge, Mass.
SAFETY AND AUTOMATIC TRAIN CONTROL FOR RAIL RAPID TRANSIT SYSTEMS.
Final rept. Mar-Dec 73,
R. J. Pawlak, A. M. Colella, N. Knable, R. H. Robichaud, and E. D. Sussman. Jul 74, 271p*
DOT-TSC-OST-74-4

Descriptors: *Rapid transit railways, *Safety engineering, Automatic control, Reviews, Design standards, Human factors engineering, Revisions, Planning.

The anticipated construction and expansion of rail rapid transit systems in the United States over the next 10-15 years implies major capital expenditures. A significant level of automation in train control is likely to be central to these systems. The potential safety problems associated with various implementation alternatives, several possible levels of automation, and uncertainty in the corresponding proper role of the human operator raise issues requiring timely resolution. The report describes the state-of -the-art in rail rapid transit system automatic train control, assesses the safety related interrelations between the train control system, functions of the human operator and other portions of the total system, and makes recommendations to aid the process of planning, funding approval, design, implementation, test, safety certification and operation of new systems or modifications of existing systems.

PB-235 671/5GA PC$4.75/MF$2.25
Consortium of Universities, Washington, D.C. Urban Transportation Center.
FACTORS AFFECTING CARGO LIABILITY PROBLEMS IN URBAN GOODS MOVEMENT AND PROPOSED SOLUTIONS.
Research rept.,
John J. Kenkel. May 74, 93p UTC-74-03 UMTA-DC-11-0003-74-1
Contract DOT-UT-394

Descriptors: *Cargo transportation, *Intermodal shipping, *Liabilities, Urban areas, Damage, Losses, Delay time, Standards, Insurance.
Identifiers: *Intermodal cargo transportation.

The report explores the liability problems associated with the intermodal movement of goods into, out of, and through urban areas. It focuses on loss, damage, delay of shipments, and stresses the susceptibility of small shipments to loss, damage and delay. The relationship of liability to the urban area is particularly strong since approximately 85 per cent of the loss and damage occurs at the interfacing terminals in the urban area. The inadequacies of present recovery practices and procedures are discussed, as well as the need for uniform standards of liability for intermodal cargo shipments.

PB-235 703/6GA PC$7.00/MF$2.25
Boeing Vertol Co., Philadelphia, Pa. Surface Transportation Systems Dept.
SOAC (STATE-OF-THE-ART CAR) DEVELOPMENT PROGRAM. VOLUME I. DESIGN, FABRICATION AND TEST.
Final rept. Jun 71-Aug 73.
Apr 74, 193p D174-10031-1 UMTA-IT-06-0026-74-1
Contract DOT-UT-10007

Descriptors: *Rapid transit railways, *Tracked vehicles, *Design, Electric motors, Braking, Traction, Systems engineering, Acceptance tests, Cost estimates.

Design, fabrication and test of two new State-of-the-Art Cars (SOAC) whose objective is to demonstrate the current state-of-the-art in rail rapid transit vehicle technology were carried out. Passenger convenience and operating efficiency were primary goals. The SOAC features a DC-DC chopper in the propulsion system, separately excited DC traction motors, all-steel construction (with molded fiberglass ends), and vandal-resistant and fire-retardant materials in the interior. This volume, Volume 1 of a two-volume report, covers the development program through engineering testing; including data on design and performance, propulsion and braking, subsystems, test program, mockup and demonstration programs, and economic analysis.

PB-235 942/0GA PC$17.25/MF$2.25
Pioneer Engineering and Mfg. Co., Inc., Warren, Mich.
SURVEY OF SUSPENSION SYSTEMS ON VEHICLES TOWING TRAVEL AND CAMPER TRAILERS. VOLUME XI.
Final rept. May 71-Mar 72,
Norman Ludtke. Jun 74, 754p DOT-HS-801 100
Contract DOT-HS-098-1-136
See also Volume 10, PB-230 722.

Descriptors: *Trailers, *Suspension systems(Vehicles), Loading procedures, Tires, Springs(Elastic), Vehicle wheels, Axles.
Identifiers: *Axle loads, *Weight limits, Recreational vehicles.

Loading patterns, load capacities and consumer knowledge in these areas were determined for 8,800 vehicles consisting of travel trailers, camper trailers, motorhomes and pickup trucks carrying slide-in campers. Vehicles were weighed as they were on the road in operating condition. The rating data of the suspension components was obtained from the vehicle manufacturer.

13G. Hydraulic and Pneumatic Equipment

AD-785 755/0GA PC$4.25/MF$2.25
Mcdonnell Douglas Astronautics Co Titusville Fla
RELIABILITY TESTING OF LAMINAR JET FLUIDIC ELEMENTS.
Final rept.,
W. J. Westerman, and R. E. Wright. 1 Jun 74, 69p Rept no. L0266
Contract DAAG39-72-C-0001
See also AD-774 365.

Descriptors: *Fluidics, *Contamination, Flueric devices, Fluidic amplifiers, Bistable devices, Fluidic control, Laminar flow, Brass, Stainless steel.
Identifiers: *Proportional amplifiers.

Laminar jet fluidic elements were evaluated for the Harry Diamond Laboratories as a supplement to Contract No. DAAG39-72-C-0001. An evaluation of results is presented and compared to performance of turbulent elements tested under the basic contract. A comprehensive photographic presentation of contamination buildup is included. The program encompassed a total of 24 elements investigated of which 16 were proportional and 8 were bistable.

AD-785 949/9GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
PROBLEMS OF CONSTRUCTING CONTROL DEVICES WITH SMST-2 MODULES,
I. V. Vaiser, Yu. V. Vanskii, A. M. Kasimov, V. M. Yarol, and V. F. Skvortsov. 1 Apr 74, 13p Rept no. FSTC-HT-23-1643-73
Trans. of International Fluidics Conference (4th), Varna (Bulgara), 14-18 Oct 72. Paper F-2, n.p., n.d., 8p.

Descriptors: *Digital computers, *Fluidics, Logic circuits, Modular construction, Air ejectors, Assembly, Translations, USSR.
Identifiers: SMST-2 computers.

Practical applications of the digital fluidic SMST-2 modules are described. The principles of construction of the fluidic modules and communication panels, performance values, supply networks, and the choice of design solution ensuring the standardization of devices are discussed. Module fabrication is outlined.

AD-785 977/0GA PC$4.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
PNEUMONICS AND MODELS,
L. A. Zalmanzon. 1970, 53p Rept no. FSTC-HT-23-2158-72
Technical trans. of mono. Pnevmonika i Modeli, Moscow, 1970 53p.

Descriptors: *Pneumatic devices, Models, Fluidics, Fluerics, Fluid control, Fluid amplifiers, Translations, USSR.

N74-29527/0GA PC$25.50
Electronic Communications, Inc., St. Petersburg, Fla.
ACTUATOR DIGITAL INTERFACE UNIT (AIU).
Final Report.
Oct 73, 448p NASA-CR-120328
Contract NAS8-26755

Descriptors: *Actuators, *Control units (Computers), *Data systems, *Space shuttles, Data processing equipment, Data processing terminals, Hydraulic equipment, Mathematical models, Servomechanisms.

For abstract, see STAR 1219

PAT-APPL-420 424 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FLUID CONTROL APPARATUS AND METHOD.
Patent Application.
C. W. McKee. Filed 30 Nov 73, 12p NASA-CASE-LAR-11110-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Centrifuges, *Fluid filters, *Gas-liquid interactions, *Separators, *Weightlessness, Equipment specifications, *Patent applications, Product development.

An apparatus for controlling fluids and gases in a zero gravity environment is described. The device consists of a circumnutating chamber which applies centrifugal force in separating gas from liquid. The liquid is forced by the circumnutating motion to travel in a path around the circular wall and periodically past a valve which drains off only the liquid. Gases are removed by a conduit which is protected from fluid droplets by baffles. The construction of the device makes it possible to eliminate seals between the moving parts of the system.

13H. Industrial Processes

AD-785 597/6GA PC$4.25/MF$2.25
Bell Helicopter Co Fort Worth Tex
EVALUATION OF THE ADHESIVE BONDING PROCESSES USED IN HELICOPTER MANUFACTURE. PART 7. PREPRODUCTION EVALUATION OF IMPROVED TITANIUM SURFACES PREPARATION.
Technical rept.,
Narvel L. Rogers. Sep 74, 69p PA-TR-4700
Contract DAAA21-74-C-0109

Descriptors: *Titanium, *Adhesive bonding, *Surface finishing, Helicopters, Sheets, Phosphates, Fluorides, Acceptance tests, Bonded joints.

The PHOSPHATE-FLUORIDE TREATMENT (STABILIZED) has been compared directly to a standard Phosphate-Fluoride Treatment for the surface preparation of commercially pure titanium sheet. The stabilized treatment process was found to provide an improvement in the durability of adhesive bonded joints exposed to moisture and stress. The treatment processes were compared for their effect on the properties of the basis metal as well as for bondability and durability. Laboratory evaluations included standard specification qualification testing as well as special durability tests. (Author)

AD-785 802/0GA Reprint
Florida Univ Gainesville Dept of Industrial and Systems Engineering
ANALYSIS OF CLOSED-LOOP CONVEYOR SYSTEMS, THE DISCRETE FLOW CASE,
Eginhard J. Muth. Jan 74, 13p AROD-11621.3-M
Contract DAHC04-68-C-0002, Grant DA-ARO-D-31-124-73-G149
Revision of report dated Dec 72.
Availability: Pub. in AIIE Transactions, v6 n1 p73-83 Mar 74.

Descriptors: *Conveyors, *Closed loop systems, Mathematical models, Matrices(Mathematics), Difference equations.
Identifiers: Materials handling equipment.

A closed-loop conveyor system having a single loading station, a single unloading station, and discrete, time-varying input and output flows, is analyzed. The sequence of material flow on the return leg of the conveyor is represented by a difference equation. That equation is reduced to a matrix formulation. Incompatibility is related to the eigenvectors and eigenvalues of the matrix involved, and a general solution procedure is given. The ratio r/p, which is the remainder of the ratio conveyor period to work-cycle period, is shown to be an important criterion for compatibility and optimization. An example is worked out and several solutions are presented graphically. (Author)

AD-785 910/1GA PC$3.25/MF$2.25
Northeastern Univ Boston Mass
BULK STRIP PRODUCTION OF AN AMORPHOUS CU-ZR ALLOY BY PLASMA ARC SPRAYING.
Technical rept.,
B. C. Giessen, N. M. Madhava, R. J. Murphy, R. Ray, and J. Surrette. Aug 74, 15p Rept no. N14-68-A-207-6-1
Contract N00014-68-A-0207-0006

Descriptors: *Deposition, *Copper alloys, Zirconium alloys, Coatings, Electric arcs, Plasmas(Physics), Amorphous materials.
Identifiers: *Plasma arc spraying, Metal strip.

The background and design of a plasma spray unit with a rotary copper substrate and contained in an inert gas chamber is described. This unit is capable of producing amorphous alloys as strip of > 30 mil thickness in bulk quantities at rates of 15 g/min, as demonstrated by the retention of amorphous Cu.60Zr.40. (Author)

AD-785 982/0GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THE 'INDUCTOR-PRODUCT' SYSTEM AS A CONTROL OBJECT FOR INDUCTIONAL CONTINUOUSLY SUCCESSIVE HEATING,
N. E. Razorenov. 10 Dec 73, 10p Rept no. FSTC-HT-23-1425-73
Trans. of Inzhenerno-Fizicheskii Zhurnal (USSR) v20 n3 p476-480 1971.

Descriptors: *Transfer functions, *Induction heating, Machines, Metals, Automatic, Control, Temperature, Detectors, Translations, USSR.

The article considers a method for the analytical description of the transfer functions of a regulated object during inductional continuous-sequential heating in inductors of finite length. Fast technological processes of hot plastic deformation, thermal treatment and the welding of metals with the inductional continuous-sequential heating (ICSH) with built-in control and regulating systems (CRS) for the temperature regimes with the aid of photoelectric temperature sensors are widely used in metallurgy and machine building. When such systems are designed, it is necessary to have a mathematical description of the regulated object, i.e., the transfer functions which relate the temperature of the product at the output of the inductor to the main controlling and perturbing actions.

AD-786 087/7GA Reprint
California Univ Berkeley Electronics Research Lab
MODEL FOR EXPOSURE OF ELECTRON-SENSITIVE RESISTS,
J. S. Greeneich, and T. Van Duzer. 23 May 73, 6p
AROD-8324.11-E
Grant DA-ARO-D-31-124-70-G60
Availability: Pub. in Jnl. of the Vacuum Science and Technology, v10 n6 p1056-1059 Nov/Dec 73.

Descriptors: *Masking, Mathematical models, Electron beams, Sensitivity.

A mathematical model for the exposure of electron-sensitive resists on a structure coated with a thin layer of resist is presented. The calculations yield contours of equal absorbed energy density in the resist and these are interpreted as the contours which bound the resist after development. The authors calculate the exposure for an electron beam of vanishingly small cross-section, a beam of Gaussian current-density distribution, single lines, parallel lines, and areas. (Modified author abstract)

AD-786 211/3GA PC$3.75/MF$2.25
Avco Everett Research Lab Inc Everett Mass
LASER WELDING TECHNIQUES FOR FABRICATION OF NAVAL VESSELS.
Final technical rept.,
E. Locke. Jul 73, 43p*
Contract N00024-72-C-5584

Descriptors: *Ships, *Laser welding, *Aluminum alloys, *Titanium alloys, *Steel, Carbon dioxide lasers, Microstructure, High velocity, Welds.
Identifiers: Aluminum alloy 5456, Steel Hy-130, Steel Hy-180, Titanium alloy 6Al 4V.

This work represents a preliminary investigation of the use of high power lasers for welding a variety of exotic materials at high speeds in several joint configurations. The results of the program indicate that high speed narrow, deep penetration welds similar to those made with a vacuum electron beam are achievable with a 10 KW laser. However, to generate porous-free welds it is imperative that the gas shielding be done properly. The problem of gas shielding is particularly aggravated at the very high speeds achievable in some of the thinner materials. However, shiny beads were obtained in titanium, even at speeds of 300 IPM, and over. The aluminum welds were far from satisfactory, but indications obtained outside the scope of this program with 1/4 inch thick 2219 aluminum indicate solid welds can be achieved. (Author)

AD-786 214/7GA PC$3.75/MF$2.25
United Aircraft Research Labs East Hartford Conn
LASER WELDING OF NAVY SHIP CONSTRUCTION MATERIALS.
Final rept. 30 Jun 72-30 Jun 73,
Conrad M. Banas. 30 Aug 73, 34p* Rept no. UARL-M911502-6
Contract N00024-72-C-5585

Descriptors: *Ships, *Laser welding, *Steel, *Titanium alloys, *Aluminum alloys, Carbon dioxide lasers, Microstructure, X ray diffraction, Vanadium alloys, High velocity, Welds.
Identifiers: Titanium alloy 6Al 4V, Aluminum alloy 5456, Steel HY-130, Steel HY-180.

An experimental investigation was conducted of laser welding of Navy ship construction materials. Bead-on-plate penetrations were formed in 1/4-in.-thick HY-130 steel, 1/16-in.-thick HY-180 steel, 1/8- and 1/4-in.-thick Ti-6Al-4V titanium alloy and in 1/8-in.-thick 5456 aluminum alloy. Continuous carbon-dioxide laser power levels to 8 kW were used; welding speed was varied from 20 to 180 ipm in order to establish appropriate welding parameters. The bead-on-plate penetrations were initially screened by visual, metallographic, NDT and mechanical tests and then forwarded to NSSC for more detailed evaluation. The finished samples, which were 5 x 7 in. in size, exhibited excellent top and bottom surface bead characteristics and defect-free fusion zones. (Modified author abstract)

BDX-613-1123(Rev.) PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.
DEVELOPMENT OF A FORMING STATION.
J. D. Sheeley. Aug 74, 10p
Contract AT(29-1)-613

Descriptors: (*Aluminium, *Fabrication), (*Mylar, Fabrication), (*Polycarbonates, Fabrication), Automation, Bonding, Composite materials, Design, Dies, Films, Lamellae, Layers, Pressing, Sheets.

For abstract, see NSA 30 08, number 23400.

BDX-613-1158(Rev.) PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.
ULTRASONIC WELDING OF ELECTRICAL TERMINATIONS.
G. S. Darner. Aug 74, 10p
Contract AT(29-1)-613

Descriptors: (*Electrical equipment, *Ultrasonic welding), Aluminium, Copper, Deformation, Environment, Hardness, Performance testing, Wires.

For abstract, see NSA 30 08, number 23402.

CLM-L-24 PC$4.00/MF$2.25
UKAEA Research Group, Abingdon. Culham Lab.
SURFACE TREATMENTS BY LASER.
J. W. Hill, M. J. Lee, and I. J. Spalding. Jan 74, 10p
U.S. Sales Only.

Descriptors: (*Steels, *Surface treatments), Bonding, Descaling, Laser radiation, Metals, Powders, Surface coating, Surface hardening.

For abstract, see NSA 30 08, number 23440.

LA-UR-74-937 PC$5.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
HIGH RATE PHYSICAL VAPOR DEPOSITION OF REFRACTORY METALS.
M. A. Sherman, R. F. Bunshah, and H. A. Beale. 1973, 39p CONF-740645-1

Descriptors: (*Molybdenum, *Vapor plating), (*Alloy-tzm, Vapor plating), (*Niobium, Vapor plating), (*Vanadium, Vapor plating), Ductility, Foils, Grain size, Hardness, Impurities, Production, Substrates, Time dependence, Yield strength.

For abstract, see NSA 30 08, number 21618.

N74-29878/7GA PC$11.50/MF$2.25
Technische Universitaet, Hanover (West Germany).
MASSIVE COLD FORMING OF HEAVY METAL PLATE PARTS KALT - MASSIVUMFORMEN VON GROBBLECHTEILEN.
Ph.D. Thesis.
M. Rick. 1972, 170p
Language in German.

Descriptors: *Cold working, *Forming techniques, *Metal plates, Extruding, Metal cutting, Metal drawing, Metal working, Pressing (Forming).

For abstract, see STAR 1219

N74-29882/9GA PC$12.25/MF$2.25
Technische Universitaet, Hanover (West Germany).
MAGNETIC FIELD EFFECTS IN METAL-BUFFER GAS WELDING (A CONTRIBUTION TO THE BEHAVIOR OF ARCS, THE MATERIAL TRANSFER AND THE FUSION DIMENSION AND FORM IN BUFFER GAS WELDING DURING SUPERIMPOSITION OF LONGITUDINAL MAGNETIC FIELDS) BEEINFLUSSUNG DER METALL-SCHUTZGASSCHWEISSUNG DURCH MAGNETFELDER (EIN BEITRAG ZUM VERHALTEN DES LICHTBOGENS, DES MATERIAL-UEBERGANGES SOWIE DER EINBRANDGROESSE UND-FORM FUER DIE SCHUTZGASSCHWEISSUNG BEI UEBERLAGERUNG LONGITUDINALER MAGNETFELDER).
Ph.D. Thesis.
H. B. Basler. 1973, 181p
Language in German.

Descriptors: *Arc welding, *Magnetic control, *Magnetic fields, Aluminum, Electromagnetic pulses, Magnetic effects, Mass transfer, Sputtering, Steels, Wire.

For abstract, see STAR 1219

N74-29930/6GA PC$4.75/MF$2.25
McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.
DRAW FORMING OF SCALE SHUTTLE EXTERNAL TANK DOME GORES.
Final Report, 1 Mar. - 15 May 1974.
G. Garfield. May 74, 32p NASA-CR-120311, MDC-G7413
Contract NAS8-30666

Descriptors: *External stores, *Fabrication, *Metal working, *Tanks (Containers), Equipment specifications, Manufacturing, Product development, Production engineering.

For abstract, see STAR 1219

N74-29934/8GA PC$4.00/MF$2.25
Artech Corp., Falls Church, Va.
GLASS-BEAD PEEN PLATING.
Final Report, Mar. - Dec. 1973.
J. R. Graves. Feb 74, 20p NASA-CR-139041
Contract NAS5-21925

Descriptors: *Aluminum coatings, *Metal powder, *Peening, *Sprayed coatings, Copper, Nickel, Plating.

For abstract, see STAR 1219

N74-29974/4GA PC$14.25/MF$2.25
Technische Universitaet, Hanover (West Germany).
CHEMICAL COMPOSITION EFFECTS ON THE DEFORMATION RESISTANCE OF STEEL DURING COLD AND HOT FORMING UEBER DEN EINFLUSS DER CHEMISCHEN ZUSAMMENSETZUNG AUF DIE FORMAENDERUNGSFESTIGKEIT VON STAHL BEIM KALT- UND WARMUMFORMEN.
Ph.D. Thesis.

H. J. Beer. 1973, 225p
Language in German.

Descriptors: *Carbon steels, *Chemical composition, *Creep strength, Chromium alloys, Cold working, Hot working, Molybdenum alloys, Nickel alloys.

For abstract, see STAR 1219

N74-29977/7GA PC$10.50/MF$2.25
Technische Universitaet, Clausthal-Zellerfeld (West Germany).
EFFECT OF HYDROSTATIC PRESSURE ON YIELD STRESS AND STRAIN PROPERTIES OF METALLIC WORKING MATERIALS EINFLUSS VON HYDROSTATISCHEM DRUCK AUF FLEISSSPANNUNG UND FORMAENDERUNGSVERMOEGEN METALLISCHER WERKSTOFFE.
Ph.D. Thesis.
W. Lorrek. 24 Jul 72, 149p
Language in German.

Descriptors: *Hydrostatic pressure, *Metal working, *Plastic deformation, *Yield strength, Brittleness, Ductility, Forming techniques, Mechanical properties, Stress-strain-time relations.

For abstract, see STAR 1219

N74-30959/2GA PC$4.75/MF$2.25
Technische Hochschule, Munich (West Germany).
ON THE SPUTTERING MECHANISM BY LIGHT IONS IN THE KEV ENERGY REGION UEBER DEN MECHANISMUS DER ZERSTAEUBUNG DURCH LEICHTE IONEN IM KEV ENERGIEBEREICH.
Ph.D. Thesis.
R. Weissmann. 1973, 35p
Language in German.

Descriptors: *Copper, *Sputtering, *Thin films, *Vapor deposition, Beryllium, Film thickness, Ionization, Niobium, Proton scattering, Semiconducting films, Substrates, Tantalum, Vanadium.

For abstract, see STAR 1220

N74-30963/4GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
BONDING AND ADJOINING TECHNOLOGY: A COMPILATION.
Technology Utilization.
1974, 25p NASA-SP-5925(03)

Descriptors: *Bonding, *Brazing, *Technology utilization, Pipes (Tubes), Research and development, Welded joints.

For abstract, see STAR 1220

N74-30996/4GA PC$4.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
PHASE TRANSFORMATIONS DURING THERMAL TREATMENT OF ALLOY VT18.
O. S. Korobov, K. M. Borzetsovskaya, Y. M. Lebedev, N. M. Semenova, and L. A. Yelagina. Jul 74, 8p NASA-TT-F-15470
Contract NASW-2481
Tran-Transl. Into English from the Book "Fazovyye Prevrashcheniya Pri Termicheskoy Obrabotke Splava VT18" Moscow, Nauka Press, 1972 p 74-77.

Descriptors: *Heat treatment, *Phase transformations, *Titanium alloys, Hardening (Materials), Lattice parameters, Microstructure, Tempering.

For abstract, see STAR 1220

N74-31006/1GA PC$11.00/MF$2.25
Westinghouse Astronuclear Lab., Pittsburgh, Pa.
TDNICR (NI-20CR-2THO2) FORGING STUDIES.
Final Report.
A. M. Filippi. Feb 74, 157p NASA-CR-134619, WANL-M-FR-74-001
Contract NAS3-15548

Descriptors: *Chromium alloys, *Forging, *Nickel alloys, *Thermodynamic properties, Creep rupture strength, High temperature, Tensile properties.

For abstract, see STAR 1220

PATENT-3 794 814 Not available NTIS
Atomic Energy Commission, Washington, D.C.
CONTINUOUS DYNAMIC ERROR MONITORING DEVICE FOR NUMERICALLY CONTROLLED MACHINES.
Patent,
Clark M. Lay, James H. Burkhardt, Jr., and Thomas W. Davidson. Filed 15 Feb 73, patented 26 Feb 74, 7p PAT-APPL-332 944
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Production engineering, *Numerical control, *Patents, Errors, Monitors.
Identifiers: PAT-CL-235-92-MP.

It is an object of this invention to provide a system for measuring the dynamic error of a movable member of a numerically controlled machine.

PATENT-3 826 729 Not available NTIS
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SPUTTERING HOLES WITH ION BEAMLETS.
Patent Pat 02inventors (to NASA).
D. C. Byers, and B. A. Banks. Patented 30 Jul 74, 2p PAT-APPL-292 686
Misc-Filed 27 Sep. 1972 Supersedes N72-32760 (10 - 23, p 3132).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Ion beams, *Ion sources, *Molecular beams, *Sputtering, Equipment specifications, Materials handling, *Patents, Product development.
Identifiers: PAT-CL-204-192.

Ion beamlets of predetermined configurations are formed by shaped apertures in the screen grid of an ion thruster having a double grid accelerator system. A plate is placed downstream from the screen grid holes and attached to the accelerator grid. When the ion thruster is operated holes having the configuration of the beamlets formed by the screen grid are sputtered through the plate at the accelerator grid.

SLA-74-274 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
TECHNIQUE FOR DETERMINING THE TENSILE STRENGTH OF INTERFACE BONDS.
G. A. Carlson. Jun 74, 14p
Contract AT(29-1)-789

Descriptors: (*Stainless steels, *Bonding), (*Gold, Bonding), (*Interfaces, *Tensile properties), Compression, Electron beam machining, Electroplating, Pulse techniques, Surface coating.

For abstract, see NSA 30 08, number 23429.

13I. Machinery and Tools

AD-785 844/2GA PC$7.25/MF$2.25
Stanford Univ Calif Dept of Operations Research
OPTIMAL OPERATING POLICY FOR THE MACHINE REPAIR PROBLEM.
Technical rept.,
Lola Pearl Coleman Gobeen. 5 Aug 74, 206p* Rept nos. TR-52, TR-163
Contracts N00014-67-A-0112-0058, N00014-67-A-0112-0052
Sponsored in part by National Science Foundation, Washington, D.C., grant NSF-GK-35491.

Descriptors: *Machines, *Repair, *Downtime, Failure(Mechanics), Statistical processes, Distribution functions, Queueing theory, Nonlinear programming, Cost analysis, Linear programming, Markov processes, Maintainability, Scheduling.

This paper treats the following decision problem: to assign (at the time of each failure) the failed machine to a repair facility so as to minimize the long run average cost when K greater than or equal to 2. Using the theory of Markov processes the paper discusses this decision problem under various hypotheses: (1) When failure and repair times have Erlang distribution; (2) when the M = m+n machines are divided into G classes with a failed machine being replaced only by one of like class, each repair facility operates under a pre-emptive repeat priority queue discipline with class j having priority over class I greater than j, and failure and repair times have exponential distribution; (3) when each machine is subject to delta different types of failure, the time to a failure of type i has exponential distribution, and repair times have Erlang distribution. (Modified author abstract)

AD-785 854/1GA PC$3.75/MF$2.25
Naval Air Propulsion Test Center Trenton N J
ROLLING CONTACT FATIGUE OF SILICON NITRIDE.
Final rept.,
Raymond Valori. Aug 74, 36p Rept no. NAPTC-PE-42
See also report dated Oct 73, AD-771 393.

Descriptors: *Roller bearings, *Silicon nitrides, Ceramic materials, Fatigue(Mechanics), Hot pressing, Surface finishing, Fatigue life, Skidding, Wear.

Rolling contact fatigue studies were conducted comparing hot-pressed silicon nitride and consumable vacuum melted M-50 steel. Test results showed that: (a) Silicon nitride is superior to M-50 steel by at least an order of magnitude. (b) Surface finishing process significantly effects the fatigue life of silicon nitride. (c) Silicon nitride run in contact with M-50 steel may have a detrimental effect on the fatigue life of M-50 steel. (d) Skidding may be detrimental to the surface durability of silicon nitride. (Author)

AD-785 880/6GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
ELECTROMECHANICAL MOMENTS IN A STATIONARY MAGNETIC AXISYMMETRICAL SUSPENSION,
L. A. Zhuravleva, and P. Z. Piven. 25 Jul 74, 6p Rept no. FSTC-HT-23-191-73
Trans. of Problemy Tekhnicheskoi Elektrodinamiki (USSR) n19 p139-141 1969.

Descriptors: *Suspension devices, Electromechanical devices, Moments, Rotation, Armatures, Translations, USSR.

In an ideal axisymmetrical magnetically stationary suspension in a vacuum, the rotation of the suspended body (armature) around its axis of symmetry occurs without an electromechanical moment, i.e., without attentuation. However, in real suspension systems, attenuation is observed, caused by a number of factors. The article discusses only the ements acting on the armature as it rotates about its axis of symmetry. The electromechanical moments arising when the armature rotates at low angular velocity (omega <10 deg/sec) can be divided into the moment resulting from vortex currents, the moments of elasticity and the hysteresis moment.

MLM-2124 PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.

GRINDING MACHINE FOR SHARPENING CONTOUR CUTTERS USED TO SHAPE AND SLOT ELECTRODES.
C. F. Draut, E. J. McCloskey, and J. E. Weeks. 24 Jun 74, 14p
Contract AT-33-1-GEN-53

Descriptors: (*Grinding machines, *Design), Accuracy, Cutting tools, Electrodes, Shape, Tools.

For abstract, see NSA 30 08, number 23467.

NASA-SP-5910(05) PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
MACHINE TOOLS AND FIXTURES. A COMPILATION.
1974, 25p

Descriptors: (*Machine tools, *Design), Cutting, Grinding, Machining, Materials drilling, Materials working, Milling, Surface finishing, Tools, Welding.

For abstract, see NSA 30 08, number 23468.

N74-29639/3GA PC$5.00/MF$2.25
Sydney Univ. (Australia). Dept. of Aeronautical Engineering.
FINITE ELEMENT ANALYSIS OF A HYDRODYNAMIC BEARING.
G. P. Steven. May 74, 39p ATN-7402

Descriptors: *Antifriction bearings, *Finite element method, *Incompressible fluids, *Pressure measurements, Computer programs, Flow equations, Numerical analysis.

For abstract, see STAR 1219

N74-29774/8GA PC$7.50/MF$2.25
Sperry Rand Corp., Phoenix, Ariz. Flight Systems.
DESIGN STUDY FOR A MAGNETICALLY SUPPORTED REACTION WHEEL.
Final Report.
G. Stocking, J. Dendy, and A. Sabnis. Jul 74, 88p
NASA-CR-139282, PUB-71-0489-00-00
Contracts NAS7-100, JPL-953884
Subm-Prepared for JPL.

Descriptors: *Magnetic suspension, *Reaction wheels, Ball bearings, Magnetic control.

For abstract, see STAR 1219

N74-29880/3GA PC$7.25/MF$2.25
Technische Universitaet, Hanover (West Germany).
PROCEDURE FOR AUTOMATIC THREE DIMENSIONAL OBJECT MEASUREMENTS USING COORDINATE MEASURING MACHINES VERFAHREN ZUR AUTOMATISCHEN RAEUMLICHEN OBJEKTVERMESSUNG MIT KOORDINATEN-MESSMASCHINEN.
Ph.D. Thesis.
U. Vaihinger. 1973, 82p
Language in German.

Descriptors: *Machine tools, *Measuring instruments, *Three dimensional motion, Automatic control, Computer techniques, Precision, Surface geometry.

For abstract, see STAR 1219

N74-29884/5GA PC$10.75/MF$2.25
Technische Universitaet, Munich (West Germany).
STUDY ON THE DYNAMIC BEHAVIOR OF FEED DRIVES FOR NUMERICAL CONTROLLED TOOLING MACHINES WITH OPERATING CYLINDER FEEDS AND POSITIONING CONTROL UNTERSUCHUNG DES DYNAMISCHEN VERHALTENS VON VORSCHUBANTRIEBEN FUER NUMERISCH GESTEUERTE WERKZEUGMASCHINEN MIT STELLZYLINDERANTRIEBEN UND LAGEREGELUNG.
Ph.D. Thesis.
A. Laika. 27 Jul 73, 154p
Language in German.

Descriptors: *Automatic control, *Digital techniques, *Machinery, *Tooling, Feed systems, Optimization, Positioning devices (Machinery).

For abstract, see STAR 1219

N74-29931/4GA PC$8.00/MF$2.25
Virginia Univ., Charlottesville. Div. of Mechanical Engineering.
THE EFFECT OF SUPPORT FLEXIBILITY AND DAMPING ON THE DYNAMIC RESPONSE OF A SINGLE MASS FLEXIBLE ROTOR IN ELASTIC BEARINGS.
R. G. Kirk, and E. J. Gunter. Apr 72, 98p NASA-CR-138968, ME-4040-106-72U
Contract NGR-47-005-050

Descriptors: *Bearings, *Damping, *Flexibility, *Rotors, Dynamic response, Elastic properties.

For abstract, see STAR 1219

N74-29932/2GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF AN ALL-METALLIC RESILIENT-PAD GAS-LUBRICATED THRUST BEARING.
W. J. Anderson. Jul 74, 34p NASA-TN-D-7724, E-7966

Descriptors: *Gas bearings, *Thrust bearings, Elastomers, Film thickness, Journal bearings, Temperature.

For abstract, see STAR 1219

N74-29933/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARISON OF EXPERIMENTAL AND PREDICTED PERFORMANCE OF 150-MILLIMETER-BORE SOLID AND DRILLED BALL BEARINGS TO 3 MILLION DN.
H. W. Scibbe, and H. E. Munson. Jul 74, 29p
NASA-TN-D-7737, E-7722

Descriptors: *Ball bearings, *Performance prediction, Friction, High speed, Thrust loads, Torque.

For abstract, see STAR 1219

N74-30958/4GA PC$11.50/MF$2.25
Technische Universitaet, Brunswick (West Germany).
THEORETICAL AND EXPERIMENTAL STUDIES ON RAPID ROLLER BEARINGS THEORETISCHE UND EXPERIMENTELLE UNTERSUCHUNGEN AN SCHNELLAUFENDEN ZYLINDERROLLENLAGERN.
Ph.D. Thesis.
F. Tessenow. 1973, 167p
Language in German.

Descriptors: *Antifriction bearings, *Ball bearings, *Performance tests, *Roller bearings, Data acquisition, Loads (Forces), Lubrication, Numerical analysis.

For abstract, see STAR 1220

N74-30961/8GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
HAND TOOLS: A COMPLIZATION.
1974, 26p NASA-SP-5908(05)

Descriptors: *Technology utilization, *Tools, Drills, Hardware, Taps, Test equipment, Wrenches.

For abstract, see STAR 1220

N74-30962/6GA PC$3.25/MF$2.25
California State Univ., Northridge.
EXPERIMENTAL EVALUATION OF STRESSES IN SPHERICALLY HOLLOW BALLS.
L. J. Nypan. Aug 74, 48p NASA-CR-2445
Contract NGL-05-062-002

Descriptors: *Ball bearings, *Hollow, *Stress analysis, Spheres, Strain gages.

For abstract, see STAR 1220

N74-30964/2GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
MACHINE TOOLS AND FIXTURES: A COMPILATION.
Technology Utilization.
1974, 27p NASA-SP-5910(05)

Descriptors: *Fixtures, *Jigs, *Machine tools, Patents, Technology utilization, Welding.

For abstract, see STAR 1220

PAT-APPL-467 506 PC$3.25/MF$2.25
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
APPARATUS FOR EVALUATING AND TESTING THE SHARPNESS OF POINTS.
Patent Application,
John D. Moore. 6 May 74, 16p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Measuring instruments, *Patent applications, Shape, Contours, Dimensional measurement, Micrometers.
Identifiers: Point sharpness testers.

The Patent application relates to the testing of point sharpness, and more pertinently, to a pocket-sized point sharpness tester which automatically measures the depth to width ratio of a test point and signals the user if the sharpness of the point is greater than a predetermined ratio.

PATENT-3 776 284 Not available NTIS
Atomic Energy Commission, Washington, D.C.
ARTICLE REMOVAL DEVICE FOR GLOVEBOX.
Patent,
Raymond H. Guyer, and Robert G. Leebl. Filed 20 Jan 72, patented 4 Dec 73, 5p PAT-APPL-219 302
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Glove boxes, *Containers, *Patents, Remote handling, Tubes, Materials handling.
Identifiers: PAT-CL-141-65.

The patent relates to an article removal device for a glovebox comprising a conduit extending through a glovebox wall which may be closed by a plug within the glovebox, and a fire-resistant container closing the outer end of the conduit. It houses a removable container for receiving pyrophoric or otherwise hazardous material without disturbing the interior environment of the glovebox or adversely affecting the environment outside of the glovebox.

PATENT-3 778 217 Not available NTIS
Atomic Energy Commission, Washington, D.C.
EXTRUSION DIE.
Patent,
Santiago J. Bustamante, and Donald H. Schell. Filed 31 Oct 63, patented 11 Dec 73, 4p PAT-APPL-320 587

Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Extruders, *Dies, *Patents, Extrusions, Metal working.
Identifiers: PAT-CL-425-467.

This invention relates to an extrusion die and, more particularly, to a die wherein the extruded article has a multiplicity of holes throughout its length.

SLA-74-0206 PC$4.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
MANUAL FOR USE, INSPECTION, AND MAINTENANCE OF HOISTING EQUIPMENT.
L. Stinnett. Jul 74, 33p
Contract AT(29-1)-789

Descriptors: (*Winches, *Maintenance), (*Cranes, Maintenance), Design, Equipment, Grabs, Inspection, Manuals, Materials handling, Transport.

For abstract, see NSA 30 08, number 23481.

13J. Marine Engineering

AD-785 834/3GA PC$3.75/MF$2.25
Naval Ship Research and Development Center Bethesda Md
THE EFFECT OF NOSE RADIUS ON THE CAVITATION-INCEPTION CHARACTERISTICS OF TWO-DIMENSIONAL HYDROFOILS,
Daniel T. Valentine. Jul 74, 49p Rept no. NSRDC-3813

Descriptors: *Hydrofoils, *Propellers(Marine), *Cavitation, Leading edges, Starting, Mathematical prediction, Mathematical models, Thickness, Performance(Engineering), Two dimensional flow.
Identifiers: *Cavitation inception.

Results of an analytical investigation of the cavitation properties of modified marine propeller-type hydrofoils are presented. In particular, dependence of the critical cavitation number and the cavitation-free, angle-of-incidence range on changes in the leading-edge thickness is determined. It is shown that within a narrow range of changes of leading-edge thickness, a delay in inception is possible, depending on the design problem under consideration. An increase in critical inception speed, accompanied by a sacrifice in some of the cavitation-free, angle-of-incidence range occurs for a small increase in the leading-edge thickness. A range of thickness changes exists for which beneficial results can be obtained. (Author)

AD-785 835/0GA PC$3.75/MF$2.25
Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
POWERING PREDICTIONS OF A NAVAL AUXILIARY OILER (AO) (MODEL 5326 WITH DESIGN PROPELLER 4645).
Final rept.,
Lawrence Murray, and Richard Hecker. Sep 74, 30p Rept no. SPD-544-10

Descriptors: *Tankers, *Propellers(Marine), *Propulsion engineering, Experimental design, Model tests, Military requirements, Naval research, Mathematical prediction, Correlation techniques, Performance(Engineering).
Identifiers: AO 177 vessel.

Model propulsion experiments for a Naval auxiliary oiler (AO 177) were conducted with a new design propeller. The report presents powering predictions at one displacement and two correlation allowances. Based on these predictions the propeller is considered to meet performance requirements. (Author)

AD-785 836/8GA PC$3.75/MF$2.25
Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
PERFORAMCNE CHARACTERISTICS OF THREE PROPELLERS WITH VARYING PITCH DISTRIBUTIONS ON AN INCLINED SHAFT.
Final rept.,
James G. Peck. Aug 74, 33p Rept no. SPD-497-02

Descriptors: *Propellers(Marine), *Ship structural components, *Cavitation, *Performance(Engineering), Hydrodynamics, Thrust, Torque, Force(Mechanics), Pitch(Inclination), Test methods, Test facilities, Shafts(Machine elements), Angles, Cavitation corrosion.
Identifiers: Side forces.

A series of three commercial propellers with systematic pitch reductions at the hub were characterized at zero and 15 degrees shaft angle, over a range of cavitation numbers and advance coefficients. In addition to the usual thrust and torque forces, horizontal and vertical side forces were measured. These experiments showed that varying the pitch distribution of these propellers changed the type of cavitation on the propeller without significantly affecting the performance of the propeller. (Author)

AD-785 837/6GA PC$3.25/MF$2.25
Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
CAVITATION PERFORMANCE OF A PROPELLER DESIGN FOR A NAVAL AUXILIARY OILER (AO 177) (MODEL 5326 WITH DESIGN PROPELLER 4645).
Final rept.,
K. Remmers, N. A. McDonald, and Richard Hecker. Sep 74, 25p Rept no. SPD-544-11

Descriptors: *Propellers(Marine), *Cavitation, *Tankers, Cavitation corrosion, Model tests, Performance(Engineering), Mathematical prediction, Power, Losses, Hydrodynamic configurations, Statistical data.
Identifiers: AO 177 vessel.

Cavitation experiments were performed on a model propeller designed for (AO 177). The results showed satisfactory performance concerning power loss; However, a potential problem with erosion is predicted based on these results. Additional erosion studies are recommended. (Author)

AD-785 874/9GA PC$3.25/MF$2.25
Bell Aerospace New Orleans La
WAVE-SES STUDY.
Technical rept. Jul-Aug 74,
26 Aug 74, 7p
Contract N00014-74-C-0289

Descriptors: *Surface effect ships, Marine surface propulsion, Ducts, Water flow, Augmentation, Performance(Engineering).
Identifiers: WAVE(Water Augmented Vehicles), Water augmented vehicles.

The object of this study is to evaluate the potential performance of a 2,000 ton Surface Effect Ship (WAVE-SES) propelled by a water augmented propulsion air flow.

AD-785 928/3GA PC$3.75/MF$2.25
Romualdi (James P) Pittsburgh Pa
FERROCEMENT DEVELOPMENTS IN NEW ZEALAND,
James P. Romualdi. May 74, 36p
Contract N00167-74-C-0171

Descriptors: *Ship hulls, *Boats, *Cements, Production, New Zealand.
Identifiers: *Ferrocement.

During the period August 1973 to January 1974, the author was associated with a local firm which is engaged in marine and terrestrial ferrocement activities. These activities provided an opportunity to assess the potential of ferrocement as well as the undertaking of tests of new hull construction techniques that combine ferrocement with steel fiber reinforced mortar. This report summarizes current development, assesses current potential of the material, presents the results of the test series, and ends with recommendations for future development. This report does not attempt to review the general state-of-the-art of ferrocement hull construction.

AD-786 010/9GA PC$3.75/MF$2.25
Saclant ASW Research Centre La Spezia (Italy)
TRENDS IN WORLD SHIPPING WITH PARTICULAR REFERENCE TO LARGE CRUDE-OIL CARRIERS.
Memorandum rept.,
Peter Burton. 15 Jul 74, 30p* Rept no. SACLANTCEN-SM-50
See also AD-731 015.

Descriptors: *Marine transportation, *Merchant vessels, *Petroleum products, Cargo ships, Tankers, Containerizing, Bulk materials, Oils, Commerce, Routing, Lighters(Boats), NATO, Italy.
Identifiers: Container ships, Crude oil, Liquefied natural gas, Tanker routes, Bulk carriers, Oil carriers.

The world total tonnages of both tankers and bulk carriers have increased at a higher rate than was forecast. The present tonnage and numbers of container ships are lower than were predicted. Revised forecasts of the possible short-term development of these and other classes of ship are made in the light of the 1974 world trade situation. Because of the great importance of the crude oil trade to NATO nations, several chapters are devoted to the oil trade in ships of over 60,000 tons. This part reviews the numbers and sizes of ships on each route, tanker terminals, and flags of registration. The problems of defending such ships are also briefly discussed. (Modified author abstract)

AD-786 063/8GA Reprint
Scripps Institution of Oceanography San Diego Calif Marine Physical Lab
TOWING A LONG CABLE AT SLOW SPEEDS: A THREE-DIMENSIONAL DYNAMIC MODEL,
William D. Ivers, and John D. Mudie. 1973, 13p
Rept no. MPL-U-33/71
Contract N00014-69-A-0200-6002, Grant NSF-GA-31377
Availability: Pub. in Marine Technology Society Jnl., v7 n3 p23-31 May-Jun 73.

Descriptors: *Towing cables, *Underwater, *Dynamic response, Drag, Ship motion, Maneuvers, Mathematical models, Simulation.

The gross (greater than 25 meters) three-dimensional motions of a cable towing a heavy instrument package at depths of 4 kilometers during complex maneuvers of the tow ship have been modeled using a computer program. Actual tracks of the towing vessel have been used as boundary conditions for the model, and the predicted paths for the instrument package have been compared with actual tracks of the instrument package as monitored by transponder navigation. Ship speeds during the maneuvers ranged from 0.5 to 1.5 m/sec while the length of the towing cable ranged from 4 to 6 km. Tangential drag as well as inertial forces were ignored in the model. The drag coefficient, CD, was considered to be unknown and was found by minimizing the root mean square discrepancy between observed and calculated positions of the instrument package. At the minimum rms error of 170 m, CD was 2.7, but because of the approximate nature of the simulation, this value may not reflect the actual drag coefficient for the cable. (Author)

AD-786 181/8GA PC$7.50/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div

MECHANICS OF CABLE MOORING SYSTEMS. VOLUME I. THREE DIMENSIONAL RESPONSE OF DEEP WATER MOORING LINES IN STEADY STATE FLOWS.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez, and George E. Owens.
Dec 72, 243p Rept no. COE-157
Contract N62477-72-C-0055
See also Volume 2, AD-786 182.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elastic properties, Hydrodynamic codes, FORTRAN.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language.

This study is an attempt to systematically investigate the behavior of selected cable parameters in relation to deep water mooring applications under three dimensional, steady-state loading conditions. The emphasis of this report has been placed on quantifying the three dimensional geometry and reactions of a mooring line in a directional uniform current for specific combinations of support positions, cable length, weight and diameter. Included is a study of both negatively and neutrally buoyant cables for water depths ranging from 5,000 to 25,000 ft. The solution procedure incorporates a finite element representation of the cables and the method of imaginary reactions for the calculation of the equilibrium configurations. The accuracy of this procedure is examined for the catenary loading through a comparison of cable configurations and support reactions obtained from a direct solution of the catenary equations and from the use of the finite element representation. (Modified author abstract)

AD-786 182/6GA PC$10.50/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME II. BI AND QUAD CABLE ARRAYS SYSTEMS--SUMMARY DATA REPORT.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez. Jan 73, 410p Rept no. COE-159-Vol-2
Contract N62477-72-C-0055
See also Volume 3, AD-786 183.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elastic properties, Hydrodynamic codes, FORTRAN.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language.

This report documents and summarizes in tabular form the data developed in the evaluation of both a Bi and Quad-Moored cable array system containing a large cylindrical member. Parametric variance of both physical and environmental parameters, to define each systems displacement susceptibility under directional hydrodynamic loadings were carried out. The physical parameters of interest included the cylinder length and diameter; anchor span; cable length, weight, and diameter; and the degree of positive buoyancy placed on the system. Structural systems with nominal heights of 5,000, 10,000, and 20,000 ft. were considered. The environmental parameters of interest were the current velocity and direction. (Modified author abstract)

AD-786 183/4GA PC$4.25/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME III. PARAMETRIC EVALUATION OF BI AND QUAD CABLE ARRAY SYSTEMS.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez, and Russell O. deCastongrene. Feb 73, 64p Rept no. COE-159-Vol-3
Contract N62477-72-C-0055
See also Volume 4, AD-786 184.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elastic properties, Hydrodynamic codes, FORTRAN.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language.

This report summarizes the results of a parametric sensitivity study of two cable array systems. The arrays are composed of either two or four mooring legs connected to a large cylindrical member, which is considered to be rigid. The parameters selected for determining their effect on the response characteristics of each system when subjected to directional currents, include: cable diameter and weight; length of the cylindrical member; buoyancy; anchor span and array height corresponding to nominal values ranging from 5,000 to 20,000 ft. Each combination of parameters defining a particular array was subjected to a uniform current which was varied both in magnitude and direction. The array was then analyzed to determine this system's configuration, and the loads developed both internally and externally on the structure. (Modified author abstract)

AD-786 184/2GA PC$4.25/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME IV. A COMPUTER PROGRAM FOR ANALYZING THE STEADY STATE RESPONSE OF BI AND QUAD CABLE ARRAYS.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez, and Nancy M. Muska. Dec 72, 52p Rept no. COE-160
Contract N62477-72-C-0055
See also Volume 5, AD-786 185.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elastic properties, Hydrodynamic codes, FORTRAN, Computer programs.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language.

Described are two computer programs, BIMORC and QUADMORC, which were developed to evaluate the spatial configuration of a Bi-moored and Quad-moored cable array, respectively, containing a cylindrical member. Analysis is based on a finite element representation of the cables, using a lumped parameter treatment of all external forces acting on the system. The loadings which are assumed, are that of the dead weight of the structure and the hydrodynamic forces on the cables and moored member produced by directional currents. Listing of the computer programs is given along with an example of the usage of each. Both programs are written in FORTRAN 4. (Author)

AD-786 185/9GA PC$4.25/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME V. THE RESPONSE OF A TRI-MOORED CABLE ARRAY WITH AN INCLUDED DEFORMABLE CYLINDRICAL MEMBER.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez, and Geral G. Greer. Feb 73, 71p Rept no. COE-161
Contract N62477-72-C-0055
See also Volume 6, AD-786 186.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elastic properties, Hydrodynamic codes, FORTRAN, Computer programming.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language.

This report concerns itself with the analytical problem of evaluating the equilibrium configuration of subsurface cable structures containing large, rigid or deformable bodies within the cable array. The general analytical problem is formulated and a means for solution provided which extends the realm of the application of the numerical procedure termed the method of imaginary reactions, to non-concurrent cable systems. The general procedure put forth is applicable to the three dimensional analysis of moored instrumentation arrays, surface ships, platforms and other similar moored structures. (Modified author abstract)

AD-786 186/7GA PC$4.25/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME VI. A COMPUTER PROGRAM FOR ANALYZING THE STEADY STATE CONFIGURATION OF A TRI-MOORED ARRAY WITH INCLUDED RIGID AND DEFORMABLE MEMBERS.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez, Geral G. Greer, and Ann C. Liau. Jan 73, 51p Rept no. COE-162
Contract N62477-72-C-0055
See also Volume 7, AD-786 187.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elasticity, Hydrodynamic codes, FORTRAN, Computer programs.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language, TRIDEF computer program.

A computer program, TRIDEF, is described which was developed to evaluate the spacial configuration of a tri-moored cable array containing a cylindrical member. The member may be considered to be rigid or elastically deformable. Analysis is based on a finite element representation of a cable, using a lumped parameter treatment of all external forces acting on the system. The loadings which are assumed, are that of the dead weight of the structure and the hydrodynamic forces on the cables and moored member produced by directional currents. Listings of the computer program along with an example of its usage is given. The program is written in FORTRAN 4. (Author)

AD-786 187/5GA PC$4.25/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME VII. THE STEADY-STATE BEHAVIOR OF A PYRAMID ARRAY SYSTEM.
Final rept. Nov 71-Feb 73,
Richard F. Dominguez, Geral G. Greer, and Ann C. Liau. Feb 73, 60p Rept no. COE-163
Contract N62477-72-C-0055
See also Volume 8, AD-786 188.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elasticity, Hydrodynamic codes, FORTRAN, Computer programs.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language, PYRAMID computer program.

The methodology developed to statically analyze a non-concurrent cable array composed of 6 cables within which is moored a large, rigid, delta element is presented. Analysis is based on a finite element representation of the cable, using a lumped parameter treatment of all external forces acting on the system. The loadings which are assumed

consist of the dead weight of the structure and hydrodynamic forces produced by directional currents on the cables and moored member. A computer program, PYRAMID, is described and documented in the report along with an application example to a 7,000 ft. high cable array. (Author)

AD-786 188/3GA PC$4.75/MF$2.25
Texas A and M Univ College Station Coastal and Ocean Engineering Div
MECHANICS OF CABLE MOORING SYSTEMS. VOLUME VIII. THE DYNAMIC RESPONSE OF CABLE ARRAYS SUBJECT TO LARGE CURRENT INDUCED DISPLACEMENTS.
Final rept. Nov 71-Feb 73,
Charles E. Nuckolls, and Richard F. Dominguez.
Feb 73, 77p Rept no. COE-164
Contract N62477-72-C-0055
See also Volume 7, AD-786 187.

Descriptors: *Mooring, *Deep water, *Mechanical cables, *Parametric analysis, Hydrodynamics, Buoyancy, Dynamic loads, Dynamic response, Elastic properties, Hydrodynamic codes, FORTRAN, Computer programs.
Identifiers: *Mooring cables, *Cable arrays, Finite element analysis, Hydrodynamic loading, FORTRAN 4 programming language.

A technique has been developed by means of which the rigid-body response of a bi-moored cable system to various dynamic excitations encountered during deployment and operation can be predicted. The solution technique couples the method of imaginary reactions for solving the basic cable problem with the use of the phase-plane gamma method for solving the rigid-body equations of motion. The procedure which has been developed here was first applied to a simple model which was given initial conditions but no excitation. Its response compared favorably with an experimental observation, although showing an apparent discrepancy in the modeling of the drag forces. A typical prototype system was also analyzed. Its response to both in-plane and out-of-plane current profiles are presented. (Author)

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-785 632/1GA PC$3.25/MF$2.25
Army Engineer Div Huntsville Ala
HYDRAULIC TRANSIENT PRESSURES IN PIPING,
Charles C. Huang, and Richard J. Bradshaw, Jr.
1974, 16p

Descriptors: *Antimissile defense systems, *Pipes, *Ground motion, Transients, Ground shock, Pressure, Flow rate, Cavitation, Hardened structures.
Identifiers: Safeguard antimissile defense systems, Waterhammer effect, HYTRAN computer program.

In 1969, the US Army Engineer Division, Huntsville, responsible for the SAFEGUARD facilities design, initiated a R+D program to develop and verify a new computer code for transient pressure calculations for the purpose of designing SAFEGUARD piping systems. A computer code, HYTRAN was the end product of the development and testing efforts. The purpose of this paper is to introduce HYTRAN to engineers who are concerned with hydraulic transient pressures in fluid filled piping systems subjected to strong shaking motions. The basic formulation, method of solution, cavitation, use of accumulators, modeling techniques, analysis of a typical large system, and comparison of calculated and experimental data are presented.

N74-29883/7GA PC$4.75/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
COMBINED EFFECTS OF HYDRAZINE EXPOSURE AND ENDURANCE TESTING ON SOLENOID-ACTUATED VALVE PERFORMANCE.
R. Hagler, Jr.. 1 Jul 74, 35p NASA-CR-139360, JPL-TM-33-691
Contract NAS7-100

Descriptors: *Hydrazines, *Liquid rocket propellants, *Solenoid valves, Grand tours, Liquid propellant rocket engines, Performance tests.

For abstract, see STAR 1219

N74-30921/2GA PC$8.50/MF$2.25
Hydronautics, Inc., Laurel, Md.
DESIGN AND TESTING OF A TANDEM ROW PUMP INDUCER.
R. J. Etter. Mar 74, 109p NASA-CR-120374, TR-7117-1
Contract NAS8-26591

Descriptors: *Fuel pumps, *Intake systems, *Supercavitating flow, Cavitation flow, Liquid propellant rocket engines, Systems engineering.

For abstract, see STAR 1220

13L. Safety Engineering

AD-785 598/4GA PC$7.50/MF$2.25
Underwriters' Labs Inc Tampa Fla Marine Dept
BOATING ACCIDENT INVESTIGATIONS 1973, FIRE AND EXPLOSION.
Final rept.,
Robert Loeser. 15 Mar 74, 250p* USCG-D-17-75
Contract DOT-CG-23200-A
See also AD-773 778.

Descriptors: *Boats, *Accidents, *Fires, Explosions, Failure, Fuel tanks, Marine surface propulsion, Marine engineering, Safety.
Identifiers: *Boating accidents, Accident investigations.

The report describes a program designed to provide statistically sound engineering data on what failures cause explosions and fires on boats and to ascertain why the failures occurred. Five tables have been developed to accumulate the key information from 38 investigations. In addition, the individual detailed investigation reports are provided for reference. The data tables can serve as an index for the Case Reports where the data tables provide an inadequate breakdown for some particular area of concern. This report includes a complete set of data tables for 1973, 1972 and 1970. The data tend to indicate that the effective control of all ignition sources in machinery spaces is necessary to help control fires and explosions, that the sources of fuel leakage are varied (with fuel tanks the primary source of fuel leakage) and that boat construction materials are a prime means of fire spread. With respect to fuel leakage, the report tends to indicate that galvanic corrosion and the lack of inspection are major contributing factors. (Author)

AD-785 952/3GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
DEVELOPMENT OF A STANDARD FOR AIR FORCE STRUCTURAL FIREFIGHTING PUMPERS.
Master's thesis,
Richard W. Ayars, and Gary L. Kelley. Aug 74, 98p Rept no. SLSR-13-74B

Descriptors: *Fire fighting, *Pumps, *Standards, *Logistics support, Surveys, Theses, Replacement, Acquisition.
Identifiers: *Logistics management.

In managing the acquisition of replacement structural firefighting pumpers, a basic step is deciding what to buy. In the case of pumpers, there appeared to be no standard for what firefighting capabilities new pumpers should have. These capabilities are the specific design features of the pumper to optimize its use in actual fire fighting. To that end, a random survey of fifty Air Force fire chiefs, or their assistants, was conducted. Each response to the survey represented the opinion of one fire chief on what should constitute a standard for Air Force pumpers, were he called upon the establish that standard. The collective responses, taken as representative of all Air Force fire chiefs, were the compiled into a sample standard of desired design options, if costs were not a factor. The resulting standard was not to represent a real operating pumper, but rather a management tool to be used in deciding what pumper options should be included in future acquisitions. (Modified author abstract)

CONF-740311-5 PC$4.00/MF$2.25
Allied Chemical Corp., Idaho Falls, Idaho.
SAFE CONSTRUCTION INSIDE YOUR PLANT.
L. R. Stuart. 1974, 9p
Contract AT(10-1)-1375

Descriptors: (*Industrial plants, *Safety), Construction, Equipment, Health hazards, Personnel.

For abstract, see NSA 30 08, number 23341.

NASA-SP-5928(02) PC$4.50/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
SAFETY AND MAINTENANCE ENGINEERING. A COMPILATION.
26p

Descriptors: Maintenance, Personnel, Safety.

For abstract, see NSA 30 08, number 23469.

N74-30390/0GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
SAFETY AND MAINTENANCE ENGINEERING: A COMPILATION.
1974, 28p NASA-SP-5928(02)

Descriptors: *Maintenance, *Safety devices, *Technology utilization, Computer programs, Hazards, Helmets, Liquid hydrogen, Polymers, Safety management.

For abstract, see STAR 1219

PB-235 917/2GA PC$7.25/MF$2.25
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
THE EFFECT OF LOWER LEGAL DRINKING AGE ON YOUTH CRASH INVOLVEMENT.
Final rept. 31 Jan-30 Jun 74,
Richard L. Douglas, Lyle D. Filkins, and F. A. Clark. Sep 74, 220p* UM-HSRI-AL-74-1-2 DOT-HS-801 213
Contract DOT-HS-031-3-754

Descriptors: *Motor vehicle accidents, *Alcoholic beverages, *Accident investigations, Legislation, Age, Time series analysis, Michigan, Maine, Vermont.

Several states recently lowered the legal drinking age to 18. The objectives of the study were: (1) To determine if alcohol-related crashes increased among legally affected populations in three study states, (2) to determine, if changes occurred, whether a causal relationship exists between the crash experience changes and the legal changes. Seven states were studied in a multiple-time-series quasi-experimental design. Through controlled time-series analyses it was found that statistically and socially significant increases in alcohol-related crashes resulted in Michigan and Main following the lower legal drinking age.

PB-235 921/4GA PC$4.75/MF$2.25
Indiana Univ., Bloomington. Inst. for Research in Public Safety.

A STUDY TO DETERMINE THE CAUSES OF ACCIDENTS: AN IN-DEPTH CASE REPORT-CASE NO. TAC-SP-73-3, TRACTOR-TRAILER/SCHOOL BUS - RIGHT ANGLE (FATAL).
Final rept.
Aug 74, 90p DOT-HS-801 202
Contract DOT-HS-034-3-535

Descriptors: *Motor vehicle accidents, *Accident investigations, Trailers, Buses(Vehicles), Human factors engineering, Skid resistance, Intersections, Impact, Death, Decision making.
Identifiers: Trailor school bus accidents.

The report carries the in-depth, multidisciplinary report covering Case No. TAC-SP-73-3, of a Tractor-Trailer/School Bus - Right Angle (Fatal) accident.

13M. Structural Engineering

ANL/ES-40(Vol.9) PC$4.00/MF$2.25
Argonne National Lab., Ill.
ENVIRONMENTAL STATUS OF THE LAKE MICHIGAN REGION. VOLUME 9. SOILS OF THE LAKE MICHIGAN DRAINAGE BASIN: AN OVERVIEW.
F. Stearns, F. D. Hole, and J. Klopatek. Jun 74, 22p
Contract W-31-109-eng-38

Descriptors: (*Lake michigan, *Environment), (*Michigan, *Soils), (*Wisconsin, Soils), (*Illinois, Soils), Agriculture, Indiana, Urban areas.

For abstract, see NSA 30 08, number 21169.

COM-74-50867/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TECHNIQUES FOR MEASURING WIND LOADS ON FULL-SCALE BUILDINGS.
Final rept.,
R. D. Marshall, and G. Hsi. 1970, 16p
Pub. in Proceedings of the U.S.-Japan Research Seminar on Wind Loads on Structures, Honolulu, Hawaii, 19-24 Oct 70, p133-148 1970. (Hawaii Univ., Honolulu).

Descriptors: *Buildings, *Wind pressure, Gust loads, Dynamic loads, Roofs, Pressure distribution, Maryland.

Wind pressure measurements are being made on a 4-story building on the NBS campus at Gaithersburg, Maryland. Field data will be used to develop new design criteria and to improve wind tunnel modeling techniques. Simultaneous wind velocity measurements from six meteorological towers make it possible to relate pressure distributions and fluctuations to the undisturbed wind field. Techniques developed in the course of this study are fully described, including instrumentation, data acquisition and data reduction and analysis. It is believed that the methods used for the measurement of pressures on roof areas and the establishment of a static reference pressure overcome major problems in making field measurements on full-scale buildings.

EUR-5137f PC$4.00/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
EXPERIMENTAL STUDY OF THE CURVATURE EFFECT ON THE STRESS INTENSITY FACTOR VALUE IN CYLINDRICAL SHELLS.
J. Bernard, and B. Henry. 1974, 18p
In French. U.S. Sales Only.

Descriptors: (*Stainless steel-304, *Flexural strength), (*Shells, Flexural strength), (*Tubes, Flexural strength), Cracks, Cylindrical configuration, Expansion, Fatigue, Geometry, Stresses, Variations.

For abstract, see NSA 30 08, number 23407.

PAT-APPL-478 284 PC$3.25/MF$2.25
Department of Agriculture, Washington, D.C.
COMBINATION SHEATHING SUPPORT-MEMBER BUILDING PRODUCT.
Patent Application,
Robert L. Geimer, and William F. Lehman. Filed 11 Jun 74, 12p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Structural members, *Patent applications, Compression molding, Sheathing, Supports, Wood, Particles, Wood fibers, Binders(Materials), Adhesives.
Identifiers: Integrated systems, PAT-CL-52-229.

The patent application relates to a wood-base building component of cellulosic particles and/or fibers and adhesive binder molded, in a single pressing operation, into an integral product of sheathing and support members for use in constructing wood-frame buildings. The dies used during press-molding form a flat panel containing a plurality of evenly spaced channels that serve as support members to replace conventional framing such as studs, joists, and rafters. The integral product may serve as roof, wall, or flooring components in the usual wood-frame building applications.

PB-233 912/5GA PC$3.75/MF$2.25
Lehigh Univ., Bethlehem, Pa. Fritz Engineering Lab.
ON THE BEHAVIOR OF A HEAVY STEEL COLUMN,
Negussie Tebedge, Wai-Fah Chen, and Lambert Tall. Oct 72, 41p NSF-FEL-72-337-33
Grant NSF-GK-28049

Descriptors: *Columns(Supports), Loads(Forces), Residual stress, Yield strength, Bending, Straightness, Flame cutting.
Identifiers: Steel A-36.

This report presents a theoretical and experimental analysis of the behavior and the strength of a heavy shape column built up from flame-cut plates. The theoretical part of the analysis includes the two dimensional in-plane column analyses by the tangent modulus concept and by the load-deflection approach, and by a three-dimensional biaxial bending column analysis. The effects of residual stress, yield strength variations over the cross section, and initial out-of-straightness in the two-principal axes, are considered in the theoretical analysis. To obtain experimental data on the behavior and the strength of heavy built-up columns, a complete experimental investigation was conducted on one particular shape--H23x681, ASTM 36 steel. The experimental part includes the measurement of the yield strength levels and residual stresses over the cross section, a stub column test, and a full-size column test. The column tests were conducted at the National Bureau of Standards, Gaithersburg, Maryland in their 12-million pound testing machine. (Modified author abstract)

PB-236 027/9GA PC$3.75/MF$2.25
National Swedish Inst. for Building Research, Stockholm.
INFORMATION ON CURRENT ACTIVITIES,
Nils Antoni. Jul 74, 48p

Descriptors: *Urban information systems, *Sweden, *Buildings, Environmental impacts, Human ecology, Construction industry, Design standards, Economic factors, Industrialization, Management systems, Accuracy, Control equipment, Technology development, Human factors engineering, Open space studies.

Information is given on current activities of the Institute. Reference is made to area and indoor environments, social and ecological factors, construction industry relations, design, industrialized production, management and organizational problems, renovation, control equipment, installations, tests and measurements, and allied topics.

SLA-73-1088 PC$6.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
QMESH: A SELF-ORGANIZING MESH GENERATION PROGRAM.
R. E. Jones. Jul 74, 59p
Contract AT(29-1)-789

Descriptors: (*Mechanical structures, *Design), (*Computer codes, *Q codes), Data processing, Finite element method, Organizing, Programming languages, Shape.

For abstract, see NSA 30 08, number 23328.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-785 675/0GA PC$3.25/MF$2.25
Dugway Proving Ground Utah
EVALUATION OF CLOUDS OF AIRBORNE FIBERS,
Lothar L. Salomon, John D. Trethewey, and Melvin J. Bushnell. 1972, 15p

Descriptors: *Aerosol generators, Aerodynamic characteristics, Fibers, Samplers, Atmospheric motion.

Recently, aerodynamic properties were to be formulated for a substance which occurs in the form of cylinders a few micrometers in diameter and 10 to 14 mm long (after dissemination), vastly larger than the spherical bodies 5 micrometers in diameter that represent the approximate upper limit of particles with quasi-gaseous characteristics for modeling purposes. A model was, therefore, selected and modified for these fibers and empirically validated. However, conduct of the field portion of the program was contingent upon development of a suitable fiber disseminator, procedure for establishing source strengths, quantitative sampling device for airborne fibers, fallout sampler, and assay methodology. Requisite technology performed in the crash program is outlined in this report, along with results.

AD-785 693/3GA PC$3.25/MF$2.25
Army Land Warfare Lab Aberdeen Proving Ground Md
DETERMINATION OF THE SENSITIVITY AND SPECIFICITY OF VAPOR DETECTION SYSTEMS FOR EXPLOSIVES, NARCOTICS, AND RELATED COMPOUNDS,
William A. Wall, and Herbert M. Gage. 1973, 16p

Descriptors: *Gas detectors, *Explosives, *Narcotics, Mass spectrometers, Test methods, Performance(Engineering), Sensitivity, Chromatographic analysis, Bioluminescence, TNT, Acetic anhydride, Dogs, Cocaine, Experimental design.
Identifiers: Specificity, Ionic mobility, Plasma chromatography, Ethylene glycol/dinitrate.

During the past decade a number of portable vapor detection systems have been developed in response to military and law enforcement problems. The report concerns efforts to evaluate the capabilities of certain of the most promising of these detection systems. The following detection systems have been examined: (1) Ion Mobility Spectrometer (a type of plasma chromatograph), Franklin Institute Research Laboratories; (2) Bioluminescent Sensor System, RPC Corporation; (3) Portable Quadrupole Mass Spectrometer, Varian Associates; (4) Model 27 Gelignite Detector and Model 58 Explosive Detector, Ion Track Instruments; (5) Explosive Detection Dogs, trained by Southwest Research Institute. Emphasis is on sensitivity and specificity. The compounds selected for sensitivity studies were ethylene glycol

dinitrate (EGDN), trinitrotoluene (TNT), acetic anhydride, and cocaine.

AD-785 736/0GA PC$3.75/MF$2.25
Teledyne Electronics Newbury Calif
PULSED RF FREQUENCY MEASUREMENT FOR BUILT-IN-TEST EQUIPMENT (BITE).
Final rept. Jul 73-Mar 74,
J. W. Memmen. Sep 74, 49p ECOM-73-0253-F
Contract DAAB07-73-C-0253

Descriptors: *Test equipment, Radiofrequency, Measuring instruments, Phase locked systems.
Identifiers: Built in test equipment.

The objective of the research and development program was to demonstrate the feasibility of a Pulsed RF Frequency Measurement device suitable for applications to Built-In-Test Equipment (BITE) that could be applied to various IFF and Radar equipments to monitor the carrier frequency of the rf pulses. To this end a study of pulsed RF frequency measurement methods was conducted. A technique involving a fast-gated, phase-lock loop was selected as optimum for the pulsed RF frequency measurement research and development. Various circuit functions of a fast-gated, phase-lock loop were designed and evaluated. The optimized circuit design was then integrated into a complete phase-lock loop design. A feasibility model of the pulsed RF frequency monitor was built and successfully tested. (Author)

AD-785 768/3GA PC$14.00/MF$14.00
Army Materials and Mechanics Research Center Watertown Mass Mondestructive Testing Information Analysis Center
PROCEEDINGS OF THE 1973 SYMPOSIUM ON NONDESTRUCTIVE TESTING OF TIRES HELD AT BOSTON, MASS., 10-12 APRIL 1973,
Paul E. J. Vogel. 1973, 132p* Rept no. NTIAC-74-1

Descriptors: *Tires, *Nondestructive testing, *Meetings, Aircraft tires, Vehicle chassis components, Test methods, Ultrasonics, Radiography, Infrared equipment, Safety, Army research.

Contents: Vehicle safety; The retreaded tire; Is there a substitute for the road test-a problem; The CALSPAN tire testing machine; Evaluation of the structural integrity of pneumatic tires by holographic interferometry; Ultrasonic tire testing; Infrared tire testing; X-ray tire testing.

AD-785 833/5GA PC$4.75/MF$2.25
Naval Ship Research and Development Center Bethesda Md
SAFE DESIGN AND OPERATION OF DEEP-OCEAN SIMULATION FACILITIES,
Ralph B. Allnutt, and Harold B. Prucha. Jun 74, 81p Rept no. NSRDC-4067

Descriptors: *Test facilities, *Deep oceans, *Simulation, Tanks(Containers), Hydrostatic pressure, Sea water corrosion, Specifications, Maintenance, Naval research.

Existing deep-sea simulation facilities are discussed, emphasizing specifications, design, fabrication, installation, operation, and maintenance of the facilities with particular consideration given to their safe design and operation subject to current practical constraints. Where possible reference is made to existing Government and professional codes and specifications which may apply. The report is intended to be a reference that will provide information concerning acquisition and safe operation of facilities suitable for hydrostatic testing of structures and equipment to be used in the ocean depths. (Author)

AD-785 872/3GA PC$3.75/MF$2.25
Nuclear Corp of America Burbank Calif Research Chemicals Div
A BUOYANCY-PROPELLED-TEST-BODY LABORATORY FACILITY.
Final rept. May 66-Feb 74,
John M. Killen. Jun 74, 35p Rept no. 149
Contract N00014-67-A-0113-0003

Descriptors: *Acoustic measurement, *Underwater sound, *Drag reduction, *Test equipment, Test facilities, Buoyancy, Boundary layer, Surface properties, Pressure measurement, Periodic variations, Polymers, Vertical orientation.
Identifiers: Fluctuations, Standpipes, *Buoyance propelled test models.

The physical form of a buoyancy-propelled-test-body facility and some preliminary test results are described. The facility is a 26-meter-high, 1.067-meter-diameter standpipe which can be filled with water or other liquid. An axisymmetric body rises by buoyancy and is guided up the center on a taut restraining cable. Sensors for measurement of velocity and displacement are incorporated into the guide cable. The standpipe is also equipped to provide pull-down and release of the test body, initial acceleration, and stopping. The confined space of a standpipe within the laboratory permits controlled use of drag reducing polymer in the test liquid and nucleus removal to reduce cavitation. (Modified author abstract)

AD-785 990/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
A THERMOELECTRIC INSTRUMENT FOR CONTROL TESTING OF MATERIALS AND PRODUCTS,
E. N. Pankov. 26 Apr 74, 7p Rept no. FSTC-HT-23-0089-74
Trans. of Patent (USSR) 345 425.

Descriptors: *Test equipment, Thermoelectricity, Nondestructive testing, Metals, Translations, Patents, USSR.

A thermoelectric device for the non-destructive testing of ferrous and non-ferrous metal components is described. The instrument offers greater control accuracy through the use of an additional thermocouple and differential circuitry to compensate for the heating of the cold electrode. A further mechanical improvement over previous designs is the incorporation of an easily positioned spring-loaded electrode.

AD-786 008/3GA PC$4.25/MF$2.25
Fundamental Methods Associates Inc Lawrence N Y
MACH NUMBER CORRECTIONS DUE TO WALL EFFECTS (MACH NUMBER, OBSTRUCTION) LIMITATIONS IN SOLID TEST SECTIONS ADDITIONAL LIMITATIONS IN TRANSONIC TEST SECTIONS WITH PERMEABLE WALLS,
X. Vaucheret. 10 Sep 74, 75p Rept no. FTD-HC-23-2809-74
Edited trans. of la Recherche Aerospatiale (France) p1-56 Feb 74.

Descriptors: *Wind tunnels, Transonic characteristics, Walls, Permeability, Mach number, Iterations, Translations, France.

AD-786 047/1GA PC$3.75/MF$2.25
Ung (Man T) El Segundo Calif
RECOMMENDED REQUIREMENTS FOR THE UNIVERSAL AIRCRAFT FLIGHT SIMULATOR/TRAINER.
Final rept.,
Man T. Ung. Jun 74, 31p AFFTC-TR-74-23
Contract F04700-74-C-0328

Descriptors: *Flight simulators, *Data processing, Digital computers, Analog computers, Hybrid computers, Flight training, Computerized simulation, Real time.

This report investigates various forms of computation and makes recommendations on one computing system most suitable for the UAFS/T on the basis of performance and economy. It is determined that, at this time, hybrid computation is still the least expensive means of doing real-time flight simulation of two concurrent aircraft systems without compromising the high-frequency variables. Based upon the present and future needs of the AFFTC, a representative hybrid computer configuration is drawn up. (Author)

AD-786 055/4GA Reprint
Frankford Arsenal Philadelphia Pa
DUAL-BEAM POLARISCOPE AND FRAMING CAMERA FOR DYNAMIC PHOTOELASTICITY,
Paul D. Flynn. Aug 74, 9p Rept no. FA-TA-74007
Availability: Pub. in Experimental Mechanics, v13 n4 p178-184 Apr 73.

Descriptors: *Polariscopes, *High speed photography, *Photoelasticity, Stresses, Stress strain relations, Photography, Loads(Forces), Strain gages.

Dynamic photoelasticity is concerned generally with the determination of transient stresses and strains in machine parts or structures subjected to impact or shock loading. Progress in this field has paralleled the development and application of new advances in high-speed photography. This paper describes the equipment, techniques and methodology used to study dynamic stresses in two-dimensional problems. (Author)

AD-786 057/0GA Reprint
Frank J Seiler Research Lab United States Air Force Academy Colo
STABILIZATION OF A SEISMIC ISOLATION BLOCK INERTIAL INSTRUMENT TESTING,
Emil Brodersen. 1974, 29p Rept no. SRL-TR-74-0017
Availability: Pub. in AIAA Mechanics and Control of Flight Conference Held in Anaheim, Calif. on August 5-9, 1974. P1-10, AIAA Paper No. 74-85-7.

Descriptors: *Test facilities, *Vibration isolators, Inertial systems, Test methods, Stabilization, Seismic waves, Tiltmeters, Degrees of freedom.
Identifiers: *Seismic isolation blocks, Six degrees of freedom.

A multiloop active control system provides six degree-of-freedom control of the seismic isolation block of the FJSRL Inertial Guidance Research Laboratory. A control range of 0-20 Hz is covered by liquid/bubble type tiltmeters, short period seismometers, quartz fiber angular displacement sensors, pneumatic and electromagnetic actuators. The criteria for selecting sensor types and parameters are investigated. The stability problems caused by the high pass characteristic of the inertial sensors and by the structural resonances within the isolation block are analyzed and solved. A significant improvement in seismic isolation performance by this system is shown. (Author)

AD-786 132/1GA Reprint
North Carolina Univ Chapel Hill William R Kenan Jr Labs of Chemistry
A TIME-OF-FLIGHT DETECTION SYSTEM FOR NEAR THRESHOLD PHOTOELECTRON SPECTROSCOPY,
Bilin Tsai, Tomas Baer, and Michael L. Horovitz. 17 Dec 73, 7p AROD-10200.3-C
Contract DAHC15-67-C-0223, Grant DA-ARO-D-31-124-72-G20
Revision of report dated 5 Nov 73.
Availability: Pub. in Review of Scientific Instruments, v45 n4 p494-498 Apr 74.

Descriptors: *Photoelectric emission, *Photoionization, Detectors, Electron energy.
Identifiers: *Photoelectron spectroscopy, *Time of flight spectroscopy, Autoionization.

A time-of-flight detection system and apparatus have been developed to obtain photoelectron spectra for electron energies between 0 and 1 eV. This method has the advantage of collecting and analyzing photoelectrons of all energies simultaneously and therefore compensating for low signal levels due to low light intensities or small ionization cross sections. The collection efficiency and energy resolution are highest for electrons with near zero kinetic energy (= or <100 meV). This technique has made it possible to obtain photoelectron spectra with a continuum light source dispersed by a monochromator. It is thus particularly useful for the study of autoionization events. Also presented are calculated potentials in 3-dimensional rectangular acceleration regions and the effect of initial kinetic energy on space focusing in nonconstant electric fields. (Author)

CEA-N-1699 PC$4.50/MF$2.25
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Protection.
INTERMEDIATE MEMORY COUNTING SCALER. TIME BASE AND INCORPORATED KEY PUNCH COMMAND.
R. Rigaudiere. Mar 74, 27p
In French. U.S. Sales Only.

Descriptors: (*Scalers, *Design), Counting circuits, Data acquisition, Operation, Timing properties.

For abstract, see NSA 30 08, number 21266.

COM-74-50832/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
STANDARD REFERENCE MATERIALS: STANDARD QUARTZ CUVETTES FOR HIGH-ACCURACY SPECTROPHOTOMETRY.
Final rept.,
R. Mavrodineanu, and J. W. Lazar. 1973, 5p
Pub. in Clinical Chemistry, v19 n9 p1053-1057 1973.

Descriptors: *Spectrophotometry, Quartz, Fabrication, Characteristics, Accuracy.
Identifiers: *Cuvettes.

Accurate knowledge of lightpath and parallelism of cuvettes used in spectrophotometry is one of the indispensable parameters which must be determined when accurate transmittance measurements of liquid materials is considered. A description is given of the design and techniques developed at NBS for the production of quartz cuvettes having a nominal radiation pathlength of 10 mm plus or minus 0.03 mm and a parallelism certified both with an uncertainty of plus or minus 0.0005 mm. The method and instrumentation used to determine these parameters is also described in the paper.

COM-74-50861/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MEASUREMENT OF METER BALLISTICS.
Final rept.,
Edith L. R. Corliss. Apr 74, 1p
Pub. in Jnl. of the Acoustical Society of America, v55 n4 Apr 74.

Descriptors: *Sound level meters, Resonant frequency, Damping, Impact, Ballistics.

Measurements of transient phenomena such as impact sounds are influenced by the characteristics of the metering system used. This note describes a method for obtaining the undamped natural frequency and the relative damping of a meter. From this information and the measured electrical impedance of the meter circuit the ballistic behavior of the meter can be predicted.

IFTJ-46/1 PC$5.00/MF$2.25
Institute of Nuclear Physics and Techniques, Krakow (Poland).
FORTRAN PROGRAM FOR THE INTERPRETATION OF POROSITY MEASUREMENTS BY THE TWO-WELL PULSE TECHNIQUE.
A. Kreft, and A. Lenda. Nov 73, 37p
U.S. Sales Only.

Descriptors: (*Porosity, *Measuring methods), Algorithms, Analytical solution, Aqueous solutions, Dispersions, Elements, Flowsheets, Fortran, Pulse techniques, Trace amounts, Tracer techniques, Well logging.

For abstract, see NSA 30 08, number 23298.

KFK-EXT-6/74-3 PC$4.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
EXPERIENCES WITH THE LIQUID METAL OXYGEN METER OF GULF UNITED NUCLEAR CORPORATION IN SODIUM CIRCUITS.
H. U. Borgstedt, G. Drechsler, G. Frees, and G. Wittig. May 74, 30p
In German. U.S. Sales Only.

Descriptors: (*Oxygen meters, *Performance), (*Sodium, *Chemical analysis), Electrolytic cells, Liquid metals, Thorium oxides, Yttrium oxides.

For abstract, see NSA 30 08, number 21298.

LA-5612-PR PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
RESPIRATOR STUDIES RELATED TO THE AEC DIRECTORATE OF REGULATORY STANDARDS, JANUARY 1–DECEMBER 31, 1973.
B. J. Held, P. Lowry, D. A. Bevis, T. O. Jr. Davis, and L. A. Geoffrion. May 74, 16p
Contract W-7405-eng-36

Descriptors: (*Respirators, *Research programs), Radioactive aerosols.

For abstract, see NSA 30 08, number 21043.

LBL-2299 PC$7.60/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
INORGANIC MATERIALS RESEARCH DIVISION ANNUAL REPORT, 1973.
Apr 74, 257p
Contract W-7405-eng-48

Descriptors: (*Chemistry, *Research programs), (*Solids, Research programs), (*Metallurgy, Research programs), (*Ceramics, Research programs), Inorganic compounds.

For abstract, see NSA 30 08, number 21660.

N74-29604/7GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
AUTOMATIC CONTROLS AND REGULATORS: A COMPILATION.
Technology Utilization.
1974, 36p NASA-SP-5956(01)

Descriptors: *Automatic control, *Regulators, *Technology transfer, *Technology utilization, Mechanical devices, Nasa programs.

For abstract, see STAR 1219

N74-29612/0GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DIFFRACTION STUDIES APPLICABLE TO 60-FOOT MICROWAVE RESEARCH FACILITIES.
R. F. Schmidt. Jul 73, 53p NASA-TM-X-70707, X-811-73-39

Descriptors: *Microwave equipment, *Research facilities, Antennas, Computer programs, Diffraction patterns, Fortran.

For abstract, see STAR 1219

N74-29768/0GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SOFTWARE AND MODIFICATIONS FOR AUTOMATED MICROWAVE SPECTRAL MEASUREMENTS ON THE HEWLETT PACKARD 8460 SPECTROMETER.
W. F. White. 1 Jul 74, 99p NASA-TM-X-71993

Descriptors: *Computer systems design, *Hewlett-packard computers, *Microwave spectra, *Spectrometers, Assembly language, Basic (Programming language), Computer systems programs, Control units (Computers), Wiring.

For abstract, see STAR 1219

N74-29769/8GA PC$13.75/MF$2.25
Beckman Instruments, Inc., Anaheim, Calif. Advanced Technology Operations.
PRELIMINARY FLIGHT PROTOTYPE SILVER ION MONITORING SYSTEM.
Final Report.
J. Brady. Jun 74, 214p NASA-CR-134361, FR-2656-101
Contract NAS9-13387

Descriptors: *In-flight monitoring, *Ion exchange membrane electrolytes, *Prototypes, *Silver bromides, *Systems engineering, Calibrating, Electrodes, Potable water, Potentiometric analysis, Solid state devices, Spacecraft electronic equipment.

For abstract, see STAR 1219

N74-29775/5GA PC$5.00/MF$2.25
National Bureau of Standards, Washington, D.C.
HIGH RELIABILITY SHEATHED, BERYLLIA INSULATED, TUNGSTEN-RHENIUM ALLOY THERMOCOUPLE ASSEMBLIES; THEIR FABRICATION AND EMF STABILITY.
G. W. Burns, W. S. Hurst, and M. G. Scroger. Jun 74, 38p NASA-CR-134549, NBSIR-74-447
NASA ORDER C-61545-B

Descriptors: *Beryllium oxides, *Rhenium alloys, *Thermocouples, *Tungsten alloys, Electromotive forces, Insulators, Tantalum, Temperature measurement.

For abstract, see STAR 1219

N74-29776/3GA PC$10.25/MF$2.25
ITT Aerospace/Optical Div., Fort Wayne, Ind.
SURFACE COMPOSITION MAPPING RADIOMETER INSTRUMENT.
Final Engineering/Project Report.
1974, 144p NASA-CR-139034
Contract NAS5-21112

Descriptors: *Nimbus 5 satellite, *Optical properties, *Spectroradiometers, Atmospheric composition, Earth surface, Equipment specifications, Mapping, Product development.

For abstract, see STAR 1219

N74-29785/4GA PC$19.50/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
CYBERNETIC DIAGNOSTICS OF MECHANICAL SYSTEMS WITH VIBRO-ACOUSTIC PHENOMENA.
K. M. Ragulskis. Jun 73, 329p NASA-TT-F-14899
Contract NASW-2481
Tran-Transl. Into English of the Book "Kiberneticheskaya Diagnostika Mekhanicheskikh Sistem Po Vibroakusticheskim Protsessam" Kaunas, Kpi Press, 1972 292 p.

Descriptors: *Acoustic measurements, *Mathematical models, *Mechanical devices, *Structural stability, *Vibration effects, Auto-

matic test equipment, Computer techniques, Nondestructive tests, Numerical analysis, Performance prediction, Vibration measurement.

For abstract, see STAR 1219

N74-30049/2GA PC$11.00/MF$2.25
Technische Universitaet, Hanover (West Germany).
HYGROMETRY FOR THE STUDY OF ELECTICAL MOISTURE MEASUREMENTS HYGROMETRIE UND UNTERSUCHUNG UEBER DIE ELEKTRISCHE MESSUNG DER FEUCHTE.
Ph.D. Thesis.
K. G. Groeninger. 1972, 156p
Language in German.

Descriptors: *Electro-optical effect, *Humidity measurement, *Moisture meters, Computer techniques, Electrical resistance, Electronic equipment, Hygrometers, Semiconductor devices.

For abstract, see STAR 1219

N74-30599/6GA PC$5.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MSFC SKYLAB NEUTRAL BUOYANCY SIMULATOR.
Aug 74, 172p NASA-TM-X-64844
Contract NAS9-6555
Subm-Prepared by Mcdonnell-Douglas Astronautics CO., St. Louis.

Descriptors: *Astronaut training, *Skylab program, *Space flight training, *Space simulators, *Tanks (Containers), Astronaut performance, Extravehicular activity, Weightlessness.

For abstract, see STAR 1220

N74-30893/3GA PC$8.00/MF$2.25
Lockheed Missiles and Space Co., Sunnyvale, Calif. Lockheed Solar Observatory.
OPERATORS MANUAL FOR MICRODENSITOMETER CONTROL PROGRAM DENSITOMETER MODEL PDS-1010G (MODIFIED). PROGRAM TRACE VERSION 3B (SECTION 3).
Final Report.
A. M. Title. May 74, 97p NASA-CR-120378, LMSC-D402244-SECT-3
Contract NAS8-28018

Descriptors: *Computer programming, *Microdensitometers, *User manuals (Computer programs), Input/output routines, Teletypewriter systems.

For abstract, see STAR 1220

N74-30895/8GA PC$11.75/MF$2.25
Arizona Univ., Tucson. Optical Sciences Center.
STUDY OF AN INSTRUMENT FOR SENSING ERRORS IN A TELESCOPE WAVEFRONT.
Final Report.
L. J. Golden, R. V. Shack, and P. N. Slater. May 74, 174p NASA-CR-120353
Contract NAS8-27863

Descriptors: *Error analysis, *Telescopes, *Wave fronts, Aberration, Interferometers, Polarization (Waves), Sensors.

For abstract, see STAR 1220

N74-30896/6GA PC$4.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
A CONTACTLESS MEASUREMENT SYSTEM FOR CONTINUOUS RECORDING OF TEMPERATURES ON ROTATING PARTS, ESPECIALLY IN ELECTRICAL MACHINES.
W. Raasch, and D. Schein. Aug 74, 22p NASA-TT-F-15832
Contract NASW-2483

Tran-Transl. Into English from Techn. Mitt. Aeg-Telefunken (West Germany), V. 63, No. 7, 1973 p 278-284.

Descriptors: *Rotating bodies, *Temperature measurement, Data processing, Display devices, Electrical properties.

For abstract, see STAR 1220

N74-30897/4GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
ANALYTICAL TECHNIQUES AND INSTRUMENTATION: A COMPILATION.
1974, 28p NASA-SP-5957(03)

Descriptors: *Materials science, *Measuring instruments, *Systems analysis, Quality control, Systems engineering, Technology utilization.

For abstract, see STAR 1220

PAT-APPL-450 521 PC$3.25/MF$2.25
Atomic Energy Commission, Washington, D.C.
COMPACT FAST ANALYZER OF ROTARY CURVETTE TYPE.
Patent Application,
Louis H. Thacker. Filed 12 Mar 74, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Photometers, *Fluorometers, Alignment, Rotors, Chemical analysis, Optical measuring equipment.
Identifiers: PAT-CL-23-230, *Rotary curvette analyzers.

The patent application describes a compact fast analyzer of the rotary cuvette type for simultaneously determining concentrations in a multiplicity of discrete samples using either absorbance or fluorescence measurement techniques. A rigid, generally rectangular frame defines optical passageways for the absorbance and fluorescence measurement systems. The frame also serves as a mounting structure for various optical components as well as for the cuvette rotor mount and drive system. A single light source and photodetector are used in making both absorbance and fluorescence measurements. Rotor removal and insertion are facilitated by a swing-out drive motor and rotor mount.

PAT-APPL-464 427 PC$3.25/MF$2.25
Atomic Energy Commission, Washington, D.C.
DEVICE FOR MEASURING BIAXIAL STRAIN.
Patent Application,
Thomas R. Billeter. Filed 26 Apr 74, 17p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Strain measuring instruments, *Patent applications, Cavity resonators.
Identifiers: PAT-CL-73-88-5.

The patent application describes a device for measuring the biaxial strain of a test specimen using a coaxial resonant cavity, made to resonate in at least two different modes by electromagnetic energy supplied to the cavity.

PAT-APPL-486 802 PC$3.25/MF$2.25
Department of the Air Force Washington D C
EDDY SONIC STETHOSCOPE.
Patent application,
Victor E. Pike. Filed 9 Jul 74, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Nondestructive testing, *Acoustic detection, *Stethoscopes, Patents, Vibration, Laminates, Acoustics, Acoustic detectors.
Identifiers: PAT-CL-73-673, *Patent applications.

The patent application relates to a modified eddy sonic stethoscope probe for use in the nondestructive testing of materials by imparting mechanical energy to the material causing it to vibrate and emit detectable sound waves which can be listened to with the stethoscope. A piece of expanded synthetic resinous material sold under the trademark Styrofoam is positioned between the outside of a solenoidal coil used as a doorbell type ringer and a flexible listening tube thereby effectively insulating the two elements. The armature is retained in the coil with silicone rubber to allow free movement along the longitudinal axis. A surgical boat isolates the listening tube from the workpiece.

PAT-APPL-489 009 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ELECTRICAL CONDUCTIVITY CELL AND METHOD FOR FABRICATING THE SAME.
Patent Application.
W. P. Gilbreath, M. J. Adamson, and A. Fassbender. Filed 16 Jul 74, 12p NASA-CASE-ARC-10810-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electrical resistivity, *Pipes (Tubes), Disks (Shapes), Electrodes, Glass, Laminates, *Patent applications.

A flask having a threaded neck and a cap adapted for threaded engagement on the neck is described. A laminated disk between the cap and the neck forms a gas tight seal, and the cap has a central opening that exposes a medial region of the disk. Piercing the disk through the opening are two electrodes, the inner ends of which contact the sample within the flask and the outer ends of which afford connection of test equipment. Cylindric glass tubes are fitted over the external portion of the electrodes to provide physical support; silicone rubber or the like serves to retain the glass cylinders in place and form a gas tight seal between the cylinders and the electrodes. Shrinkable tubing is shrunk over the glass tubes to afford further mechanical support and sealing.

PAT-APPL-493 363 PC$4.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TRIELECTRODE CAPACITIVE PRESSURE TRANSDUCER.
Patent Application.
G. W. Coon. Filed 31 Jul 74, 24p NASA-CASE-ARC-10711-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Capacitance, *Electrodes, *Pressure sensors, Electric bridges, Electric current, High temperature environments, *Patent applications.

A capacitive transducer and circuit which consists of two capacitive electrodes and a shield electrode, and which is suited for making measurements in a high temperature environment is described. A rise in temperature causes resistance of the insulation between the capacitive electrode to decrease, and the resistive current to attempt to interfere with the capacitive current between the capacitive electrodes. The shield electrode and the circuit coupled to it reduces the resistive current in the transducer. A bridge-type circuit coupled to the transducer ignores the resistive current and measures only the capacitive current flowing between the capacitive electrodes.

PATENT-3 787 764 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SOLID DIELECTRIC CAPACITANCE GUAGE FOR MEASURING FLUID PRESSURE HAVING TEMPERATURE COMPENSATION AND GUARD ELECTRODE.
Patent,

Carl G. Andeen, John J. Fontanella, and Donald E. Schuele. Filed 3 Dec 71, patented 22 Jan 74, 6p PAT-APPL-204 578
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure gages, *Capacitance meters, *Patents, Capacitance bridges, Dielectrics, Dielectric properties, Pressure measurement.
Identifiers: PAT-CL-324-61-P, Fluid pressure.

The patent relates to a guage whereby pressure in a fluid is measured by measuring the dielectric constant of a solid dielectric disposed in the fluid. Two electrodes are each mounted on an opposing side of the dielectric and the capacitance therebetween monitored to provide a measure of the dielectric constant of the dielectric material and hence pressure in the fluid.

PATENT-3 791 953 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SELF-SEALING ELECTROCHEMICAL OXYGEN METER.
Patent,
Bertram Minushkin, and George Kissel. Filed 31 Oct 72, patented 12 Feb 74, 3p PAT-APPL-302 431
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Oxygen, *Electrolytic cells, *Seals(Stoppers), *Liquid metal coolants, *Gas detectors, Solid electrolytes, Electrodes, Sodium.
Identifiers: PAT-CL-204 195-S.

The patent describes an electrolytic cell for measuring oxygen activity in liquid sodium. The solid electrolyte is in the shape of a disc surrounded and supported by an annular spring seal. Included are features which provide an additional back-up seal, using the product of chemical reactions between the fluids to be contained for forming a seal in situ.

PATENT-3 795 451 Not available NTIS
Atomic Energy Commission, Washington, D.C.
ROTOR FOR FAST ANALYZER OF ROTARY CUVETTE TYPE.
Patent,
James C. Mallen. Filed 24 Apr 73, patented 5 Mar 74, 4p PAT-APPL-354 041
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Photometers, Mixing, Liquids, Fluid flow, Laboratory equipment, Rotors, Chemical analysis, Capillary tubes.
Identifiers: PAT-CL-356-246, Cuvettes, *Rotary cuvette analyzers.

The invention relates to an improved rotor characterized by efficient premixing of sample and reagent liquids for use in a photometric analyzer of the rotary cuvette type. The rotor defines inner and outer circular arrays of static loading cavities or chambers disposed on a one-to-one basis centripetal to a circular array of sample analysis cuvettes. The centrifugal walls of cavities in the inner circular array of loading cavities each slope downwardly and outwardly to a respective capillary-sized passage having a bubble trap to prevent liquid flow therethrough under static conditions.

PATENT-3 799 029 Not available NTIS
Atomic Energy Commission, Washington, D.C.
PRECISION TRIMMER FOR AN ENCAPSULATED SPECIMEN.
Patent,
William R. Cole, James W. Harrison, Bruno S. Kotula, Theodore N. Tahmisian, and Jovo S. Martich. Filed 19 Dec 72, patented 26 Mar 74, 6p PAT-APPL-316 627
Government owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D. C. 20231 $0.50.

Descriptors: *Microtomy, *Patents, *Trimming, Encapsulation.
Identifiers: PAT-CL-90-38-R.

The patent describes a specimen trimmer which includes a carriage assembly which reciprocates a knife blade along a slanted table surface. The speciment is supported in a holder and precisely advanced by means of a micrometer screw towards the blade through an opening in the table surface. Periodically during the trimming operation, the specimen is precisely rotated with a goniometer to obtain a trapezoidal cross section of the trimmed portion of the specimen.

PATENT-3 800 161 Not available NTIS
Atomic Energy Commission, Washington, D.C.
PORTABLE DYNAMIC MULTISTATION PHOTOMETER-FLUOROMETER.
Patent,
Charles D. Scott, and Eddie L. Collins. Filed 19 Dec 72, patented 26 Mar 74, 8p PAT-APPL-316 628
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Photometers, *Fluorometers, Rotors, Portable equipment, Laboratory equipment, Concentration (Composition), Colorimetric analysis, Chemical analysis.
Identifiers: Cuvettes, PAT-CL-250-564, Rotary cuvette analyzers.

The patent describes a compact fast analyzer having a self-contained power supply for simultaneously determining concentrations in a multiplicity of discrete samples using either photometric or fluorometric measurement techniques and rotors defining rotary cuvette systems. A multi-position pivoted optical head assembly supports means for directing light into sample holding cuvettes as they rotate. The optical head assembly selectively positions the means for directing light at an appropriate angle depending upon whether photometric or fluorometric measurements are being made.

PATENT-3 825 760 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FLAME DETECTOR OPERABLE IN PRESENCE OF PROTON RADIATION.
Patent,
D. J. Walker, J. E. Turnage, R. M. F. Linford, and S. D. Cornish. Patented 23 Jul 74, 10p PAT-APPL-343 308
Misc-Filed 21 Mar. 1973 Supersedes N73-20042 (11 - 11, p 1237). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Flame probes, *Proton flux density, *Radiation detectors, *Ultraviolet radiation, Delay circuits, Output, *Patents, Radiation shielding, Spacecraft instruments.
Identifiers: PAT-CL-250-372.

A detector of ultraviolet radiation for operation in a space vehicle which orbits through high intensity radiation areas is described. Two identical ultraviolet sensor tubes are mounted within a shield which limits to acceptable levels the amount of proton radiation reaching the sensor tubes. The shield has an opening which permits ultraviolet radiation to reach one of the sensing tubes. The shield keeps ultraviolet radiation from reaching the other sensor tube, designated the reference tube. The circuitry of the detector subtracts the output of the reference tube from the output of the sensing tube, and any portion of the output of the sensing tube which is due to proton radiation is offset by the output of the reference tube. A delay circuit in the detector prevents false alarms by keeping statistical variations in the proton radiation sensed by the two sensor tubes from developing an output signal.

PATENT-3 828 524 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
CENTRIFUGAL LYOPHOBIC SEPARATOR.
Patent.
F. W. Booth, and R. A. Bruce. Patented 13 Aug 74, 8p PAT-APPL-169 962
Misc-Filed 9 Aug. 1971 Supersedes N72-11293 (10 - 02, p 0187).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Centrifuges, *Filters, *Separators, Colloids, Liquid-gas mixtures, Liquids, *Patents.

A centrifugal separator is described using a lyophobic filter for removing liquid particles from a mixed stream of gas and liquid under various negative or positive external acceleration conditions as well as zero g or weightless conditions. Rotating the lyophobic filter and inclining the filter to the entering flow improves the lyophobic properties of the filter, provides gross separation of larger liquid particles, and prevents prolonged contact of liquid droplets with the spinning filter which might change the filter properties or block the filter.

SLA-74-306 PC$4.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
SANDIA LABORATORIES TECHNICAL CAPABILITIES: MATERIALS AND PROCESSES SECTION.
Jun 74, 28p
Contract AT(29-1)-789

Descriptors: (*Beryllium alloys, *Mechanical properties), (*Copper alloys, Mechanical properties), (*Uranium alloys, Mechanical properties), (*Niobium alloys, Mechanical properties), Ceramics, Composite materials, Films, Measuring methods, Metallurgy, Polymers, Sandia laboratories, Zirconium alloys.

For abstract, see NSA 30 08, number 21619.

UR-3490-478 PC$4.00/MF$2.25
Rochester Univ., N.Y. Dept. of Radiation Biology and Biophysics; Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung e.V., Grafschaft/Hochsauerland (F.R. Germany). Inst. fuer Aerobiologie.
DETERMINATION OF AEROSOL MASS DISTRIBUTION IN AN AEROSOL CENTRIFUGE BY MEANS OF QUARTZ OSCILLATORS.
F. J. Moenig, N. Schwarzer, and W. Stoeber. 8p
CONF-731080-1
In German.

Descriptors: (*Aerosols, *Measuring methods), Biophysics, Centrifuges, Design, Distribution, Electronic circuits, Fluorescein, Humidity, Mass, Oscillators, Particle size, Performance testing, Quartz, Spectrometers.

For abstract, see NSA 30 08, number 23493.

WASH-1181-74 PC$8.00/MF$2.25
USAEC Division of Physical Research, Washington, D.C.
MATERIALS SCIENCES PROGRAMS, FY 1974.
Jul 74, 99p

Descriptors: (*Us aec, *Research programs), (*Metals, Research programs), (*Ceramics, Research programs), Chemistry, Cost, Materials testing, Mechanical properties, Microstructure, Physical properties, Radiation effects.

For abstract, see NSA 30 08, number 21507.

14C. Recording Devices

AD-785 771/7GA Reprint
Columbia Univ New York Dept of Mechanical Engineering

KINEMATIC DESIGN OF TONE-ARM ARTICULATION FOR MINIMUM TRACKING ERROR IN AUTOMATIC TURNTABLES,
F. Freudenstein, and E. Soylemez. 14 Feb 73, 18p
AROD-9872.1-E
Contract DAHC04-72-C-0032
Availability: Pub. in Mechanism and Machine Theory, v8 p517-532 1973.

Descriptors: *Sound reproduction systems, *Kinematics, Geometry, Tracking, Errors.
Identifiers: Computer aided design, Automatic turntables, Tone arms, Cardanic motion.

The kinematic principles involved in tracking-error elimination in automatic turntables are described. Following a discussion of conventionally pivoted designs, a procedure is developed for the kinematic synthesis of an articulated tone-arm system (Garrard Zero 100), in which essentially true-tangent tracking is achieved throughout the playing of the record. The synthesis problem is formulated as the approximation of cardanic motion or slider-crank connecting-rod motion by means of four-bar motion over a finite range of displacements. The results, which are compared to the Garrard design show that tracking error can be reduced to approximately 20 sec of arc. (Author)

AD-785 885/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
MAGNETIC INFORMATION RECORDING METHOD,
M. B. Grinbaum, A. I. Vishnevetskii, and Ya. Yu. Rebo. 3 Dec 73, 3p Rept no. FSTC-HT-23-1214-73
Trans. of Patent (USSR) 270 810, 25 Nov 67.

Descriptors: *Magnetic recording systems, Patents, Magnetic heads, Magnetic fields, Ultrasonics, Vibration, Translations, USSR.

In order to increase handling capacity and reliability of recording, the recording medium is acoustically insulated from the sound guide and placed parallel to it. Recording windings serve as magnetic heads and are placed at a distance from the recording medium so as their magnetic fields would not affect it to any considerable degree. The selection of recording location is carried out by displacing the recording head with ultrasonic vibrations.

14D. Reliability

AD-785 614/9GA PC$3.25/MF$2.25
Army Materiel Systems Analysis Activity Aberdeen Proving Ground Md
TRACKING RELIABILITY GROWTH,
Larry H. Crow. 1974, 15p

Descriptors: *Reliability, *Statistical analysis, Growth(General), Weibull density functions, Estimates, Confidence limits.

Contents: The Weibull reliability growth model; Estimation and goodness of fit procedures; Confidence bounds for MTBF; Numerical example; Application.

AD-786 230/3GA PC$3.75/MF$2.25
Texas Tech Univ Lubbock Dept of Industrial Engineering
EMPIRICAL BAYES ESTIMATION IN QUALITY CONTROL AND RELIABILITY: AN EXPOSITION AND ILLUSTRATION.
Technical rept.,
Harry F. Martz, Jr. 31 Aug 74, 29p* Rept no. TR-2
Contract N00014-73-A-0434-0001

Descriptors: *Reliability, *Quality control, *Bayes theorem, Life tests, Estimates, Failure, Electric power, Naval equipment, Sampling.
Identifiers: *Bayesian estimation.

Two real-data illustrations of the use of Empirical Bayes estimation in quality control and reliability are given. The Empirical Bayes method is applied to the problem of estimating the outage rates for two adjacent 115 kV transmission circuits of a regional power company. Comparisons are made with standard classical and Bayesian procedures. The method is also used to obtain Empirical Bayes single-sampling attributes inspection plans that achieve specified posterior consumer and producer risks. The single-sampling plans are based on the sampling inspection history from 205 past lots of U.S. Navy material. Comparisons are made with classical sampling procedures. In both examples the Empirical Bayes method is observed to yield certain improvements over the standard procedures. (Author)

N74-29876/1GA PC$5.50/MF$2.25
Michigan Univ., Ann Arbor. Systems Engineering Lab.
THEORY OF RELIABLE SYSTEMS.
Semiannual Status Report, 1 Jan. - 30 Jun. 1974.
J. F. Meyer. Jul 74, 47p NASA-CR-139379
Contract NGR-23-005-622

Descriptors: *On-line programming, *Reliability analysis, *Reliability engineering, Error analysis, Error detection codes, Failure analysis, Probability theory, Research and development, Systems analysis.

For abstract, see STAR 1219

14E. Reprography

AD-785 904/4GA PC$5.75/MF$2.25
Stanford Univ Calif Stanford Electronics Labs
EXTENDED RANGE SPATIAL FILTERS FOR IMAGE DEBLURRING.
Technical rept.,
Daniel A. Tichenor. May 74, 143p Rept nos. SU-SEL-74-008, TR-6418-3
Contract N00014-67-A-0112-0044
Sponsored in part by Sandia Labs., Livermore, Calif. and Army Electronics Command, Fort Monmouth, N.J.

Descriptors: *Photographic images, *Image processing, Optical processing, Fourier transformation, Transfer functions, Holography, White Noise, Signal to Noise ratio.
Identifiers: *Spatial filtering.

Photographic images degraded by linear, spatially-invariant blurs can often be restored using an inverse or estimation filter in a coherent optical processor. In this procedure the degraded image is input to the processor as a photographic transparency. The spatial spectrum of the image is modified by a spatial filter and inverse transformed to obtain the restored image. The dynamic range of the spatial filter places an upper bound on the performance that can be achieved. This thesis demonstrates a new method for generating spatial filters with large dynamic ranges, and derives limitations inherent in the application of such filters to image restoration. (Modified author abstract)

AD-785 931/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THE SENSITIVITY OF A RADIO-FREQUENCY THERMOGRAPHIC METHOD IN THE MILLIMETER-WAVE RANGE,
M. N. Devyatkev, and O. A. Kuleshov. 29 Oct 73, 5p Rept no. FSTC-HT-23-1211-73
Trans. of Moscow Univ. Vestnik. Seriya 3: Fizika, Astronomiya (USSR) n5 p576-577 1970, by Griswold.

Descriptors: *Photographic processing, *Millimeter waves, Translations, USSR.

This study shows that a radio-frequency thermographic method which makes use of the relation of the kinetics of development of a latent image to the temperature can yield a relatively high sensitivity when using ordinary general-purpose photographic paper and film. By choosing the proper processing conditions and developer mixture, the thermal sensitivity can reach a magnitude at which the optical density of the sections of the emulsion differed by as much as 10-12%.

AD-785 987/9GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
EXPERIENCE GAINED IN PHOTOGRAPHIC SHOP OPERATION,
Yu. A. Fedorov. 24 Apr 74, 10p Rept no. FSTC-HT-23-0159-74
Trans. of Geodeziya i Kartografiya (USSR) n1 p42-45 1973.

Descriptors: *Photographic processing, Work measurement, Proficiency, Translations, USSR.

The study deals with the experience which has been gained in a photographic shop to increase production and improve methods of operation. Working conditions should be congenial and time and motion methods used to increase labor productivity. Socialist competition should be encouraged to enable workers to work efficiently and increase overall production.

AD-785 991/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THE RELATION BETWEEN THE QUALITY OF A MOTION-PICTURE IMAGE AND THE DEGREE OF DEVELOPMENT OF THE NEGATIVE AND POSITIVE,
L. P. Krylov, I. G. Abidina, and L. I. Arkhipov. 6 Mar 74, 14p Rept no. FSTC-HT-23-1358-73
Trans. of Tekhnika Kino i Televideniya (USSR) v13 n10 p24-28 1969.

Descriptors: *Motion picture film, *Photographic processing, Photographic negatives, Images, Contrast, Translations, USSR.

The problem of the change of quality of the resultant positive image is discussed when the negative and positive are developed to different levels of contrast, the conditions of development being kept constant. When the quality of the image is assessed, the tone reproduction, sharpness, and graininess of the resulting positive image do not noticeably change at different levels of development.

N74-29725/0GA PC$4.00/MF$2.25
Maryland Univ., College Park. Computer Science Center.
EDGE AND LINE DETECTION IN ERTS IMAGERY: A COMPARATIVE STUDY.
R. Eberlein, G. J. Vanderbrug, A. Rosenfeld, and L. S. Davis. Jun 74, 17p NASA-CR-138963, TR-312
Contract NGR-21-002-351

Descriptors: *Earth resources technology satellites, *Edges, California, Digital data, Interpolation.

For abstract, see STAR 1219

UCID-16502 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
INVESTIGATION OF A NEW COLOR FILM FOR WATER PENETRATION PHOTOGRAPHY.
W. C. Herrmann. 2 Apr 74, 15p
Contract W-7405-eng-48

Descriptors: (*Photographic films, *Testing), Aerial prospecting, Color, Design, Photographic emulsions, Photography, Resolution, Sensitivity, Underwater, Water.

For abstract, see NSA 30 08, number 23431.

15. MILITARY SCIENCES

15C. Defense

AD-785 603/2GA PC$3.25/MF$2.25
Frankford Arsenal Philadelphia Pa
ELECTROSTATIC MEANS FOR INTRUSION DETECTION AND RANGING,
Alan D. Aronoff, William H. Boghosian, and Howard A. Jenkinson. 1965, 16p

Descriptors: *Intrusion detectors, *Electronic security, Military applications, Electric fields, Distortion, Electrometers, Target signatures.

The paper is based on the results of an initial study to determine the feasibility of a reliable, reasonably inexpensive electrostatic intrusion detection system for field use. The results of preliminary experimental tests appear to verify analytical studies indicating that the characteristic signature of walking persons can be detected by sensors utilizing standard portable solid state electrometers equipped with simple 5 to 10 cm wire antennas. Field test data show detectability to ranges of 8 meters and more.

AD-785 643/8GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
EXPERIMENTAL DETERMINATION OF SHOCK AND VIBRATION LEVELS INSIDE THE SAFEGUARD PARB,
Thomas E. Kennedy, and Robert E. Walker. 1973, 15p

Descriptors: *Antimissile defense systems, *Hardened structures, *Radar stations, Acquisition radar, Ground shock, Blast, Vibration, Nuclear explosion damage, Simulation.
Identifiers: Safeguard antiballistic missile systems.

Additional test data were sought to aid in application of the Dial Pack data and a series of vibration/impedance tests was conducted on both the model and the prototype. These tests consisted of vibrating points inside and outside the structures. Because the PARB is designed to remain elastic, it was possible to use the vibration data and linear theory to obtain impedance and transfer functions for various paths in the model and prototype. Using the knowledge gained from the model study and the vibration data from the prototype, impedance functions for the prototype were developed. This paper discusses the results of the impedance program, the validity of the data, and their extrapolation to predict internal vibration at high-frequency levels.

AD-785 650/3GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
MATHEMATICAL SIMULATION OF RAYLEIGH WAVE GENERATION AND PROPAGATION IN GROUND MEDIA,
Jerry R. Lundien. 1973, 16p

Descriptors: *Intrusion detectors, *Seismic detection, *Military applications, Passive defense, Target detection, Position finding, Wave propagation, Mathematical models.
Identifiers: Design.

The simulation and prediction capability discussed is presently being used in the design of military seismic sensors. Specifically, the modeling techniques can be used to: Provide engineering data for the design or modification of seismic sensor components; Separate the various seismic generation mechanisms for further detailed study; Estimate performance of new seismic sensor devices in restricted areas throughout the world; Produce data for the design of sensor fields; Produce data for sensor maps which can be interpreted from other site characteristics. The accuracy of the model is only as good as the accuracy of the input data fed to it. Thus, for situations where site data are poor, measured and predicted results can vary significantly. However, ranges of values can be examined by using site data at maximum and minimum levels, which, in turn, will provide the military planner with significant background information.

AD-785 676/8GA PC$3.25/MF$2.25
Army Advanced Ballistic Missile Defense Agency Huntsville Ala
RESOURCE ALLOCATION AND SCHEDULING IN BALLISTIC MISSILE DEFENSE ADAPTIVE CONTROL SYSTEMS,
Doyce E. Satterfield. 1974, 13p

Descriptors: *Antimissile defense systems, *Adaptive control systems, Search radar, Computers, Target detection, Target Acquisition, Threat evaluation, Scheduling, Algorithms.
Identifiers: CDC 7600 computers, Resource allocation.

The radar and computer system can be considered as the eyes and brain of a ballistic missile defense (BMD) system. Given no limitation on resources, a ballistic missile system's operational philosophy may be to utilize predetermined battle plans for the allocation of radar and computer resources. However, it is rarely economically feasible to provide excessive resources, and, since the defensive and offensive situation changes dynamically, it becomes imperative that the allocation of such resources adapt to these changes. This paper treats the radar and computer system as an adaptive control system in which the allocation of the computer preprocessing rate, radar pulse rate, and computer postprocessing rate are varied dynamically. To determine the optimal real-time allocation of the radar and computer resources, the problem was first formulated mathematically and then solved in two phases.

AD-785 916/8GA PC$5.25/MF$2.25
Research Triangle Inst Durham N C
NATURAL THERMAL VENTILATION EXPERIMENTAL STUDIES.
Final rept. Mar 73-Aug 74,
M. D. Wright, G. M. Botkin, and E. L. Hill. Aug 74, 112p Rept no. RTI-FR-43U-629-3
Contract DAHC20-71-C-0275

Descriptors: *Fallout shelters, *Ventilation, Air flow, Thermal analysis, Differential thermal analysis, Balance, Heat.

This report describes an experimental program to determine the relationship between volume air flow and temperature differential in a simulated fallout shelter with various aperture configurations as a result of the thermal buoyancy effect created by the heat given off by shelter occupants. (Author)

AD-786 175/0GA PC$4.25/MF$2.25
IIT Research Inst Chicago Ill
FIRE LABORATORY TESTS - EFFECTS OF BARRIER INTEGRITY AND FIRE VENTILATION ON SHELTER HABITABILITY.
Final rept. 1 Jan 73-30 Apr 74,
Thomas E. Waterman. May 74, 59p Rept no. IITRI-J6217-FR
Contract DAHC20-70-C-0406
See also AD-759 514.

Descriptors: *Civil defense, *Shelters, *Habitability, *Ventilation, *Fires, Barriers, Gases, Toxicity, Walls, Ceiling, Floors, Debris, Heat transfer, Blast.

The report covers experiments conducted with a shelter fire experimental facility during 1973. The facility exposes a 20 by 30 ft instrumented basement shelter to overhead debris fires representative of various building occupancies and degrees of blast damage. Poorly ventilated debris fires are shown to create more severe shelter heating than equivalent fuel loads having access to larger amounts of air. (Modified author abstract)

15E. Logistics

AD-785 613/1GA PC$3.25/MF$2.25
Army Armor and Engineer Board Fort Knox Ky
A METHODOLOGY/INSTRUMENTATION CONCEPT FOR TOTAL SYSTEM TEST AND EVALUATION OF ARMY DEVELOPMENTAL MATERIEL,
Terrell G. Covington, and Allan H. Wegner. 1974, 16p

Descriptors: *Army equipment, Test methods, Field conditions, Field tests, Logistics, Reliability, Missions.
Identifiers: *Mission reliability.

The development of this methodology/instrumentation concept for system test and evaluation evolved from and rests upon a dendritic structured evaluation/effectiveness schema. This schema was developed in conjunction with Armor and Engineer Board methodology studies on Measures of Effectiveness - a study to define the measures of effectiveness for armor and engineer test items which would undergo Development Testing Service Phase, Functional Field Testing - a study which developed the testing required for selected systems to adequately address data requirements for assessing the Mission Performance Capability, and Test Design - a study to define the general design of developmental tests.

AD-785 642/0GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
SUPPRESSIVE SHIELDING OF HAZARDOUS AMMUNITION OPERATIONS,
William P. Junkin, and Paul V. King. 1973, 16p

Descriptors: *Military facilities, Barriers, Reinforced concrete, Safety, Transportation, Disposal.
Identifiers: *Ammunition storage.

The feasibility of constructing explosion effects suppression shields has been demonstrated on a full scale test basis. This type of shield can provide a highly attractive alternative to fixed conventional reinforced concrete barricades and shelters in ammunition processing plants. They potentially can be used to provide added protection against loss of life and property while ammunition is being shipped, stored, demilitarized, or disposed.

AD-785 686/7GA PC$3.25/MF$2.25
Army Natick Labs Mass
THE BEHAVIOR OF PRESSURE STABILIZED STRUCTURAL ELEMENTS UNDER LOAD,
Earl C. Steeves. 1971, 14p

Descriptors: *Tents, *Inflatable structures, Loads(Forces), Deformation, Fabrics, Stresses, Beams(Structural), Army equipment.

A systems analysis study of the Army needs for shelters in the 1985 time frame revealed that the requirements for tentage which was lightweight, of low packaged bulk and had minimum setup and disassembly times might be achieved most completely by a tent concept consisting of a frame of highly pressurized (compared with present air supported tents) structural elements supporting a lightweight fabric barrier. Since the structural elements are pressure stabilized, they can be fabricated from lightweight, flexible material such as cloth, thus reducing the weight and bulk of the transport configuration. The use of bladders or coated fabric for these elements should provide sufficient air retention capability to eliminate the need for the continuous air supply required by current air supported tents.

AD-785 894/7GA PC$3.75/MF$2.25
Logistics Management Inst Washington D C

STUDIES IN SUPPORT OF THE AMARC: REVIEW OF COST EFFECTIVENESS ANALYSIS. VOLUME 1.
Mar 74, 42p Rept no. LMI-74-14-Vol-1
Contract SD-321
See also Volume 2, AD-785 895.

Descriptors: *Army equipment, *Army procurement, *Cost effectiveness, Management planning and control, Logistics, Maintenance, Personnel management, Manpower utilization, Systems engineering.

As part of the Army Materiel Acquisition Review Committee (AMARC) effort, LMI was asked to review cost-effectiveness analyses (COEA) that were done in early stages of program development for quality and trends in quality. That was done for five disparate Army systems developments. It was found that COEA were not looked upon as continuing efforts during program development but rather as a one-shot exercise to support the concept development package. There were many different models employed at relatively low levels in the development organizations, with little consistency among forms of models or cost data used. Little improvement with time was found. (Modified author abstract)

AD-785 895/4GA PC$3.25/MF$2.25
Logistics Management Inst Washington D C
STUDIES IN SUPPORT OF THE AMARC: THE PROJECT MANAGER. VOLUME II.
Mar 74, 23p Rept no. LMI-74-14-Vol-2
Contract SD-321
See also Volume 1, AD-785 894.

Descriptors: *Army equipment, *Army procurement, *Management planning and control, Logistics, Personnel development, Job analysis, Personnel management, Manpower utilization, Systems engineering.

This study examined Army policy and practices in the identification, selection, training, assignment, and role of project managers. Changes were recommended in Army policies and implementation processes appropriate to achieve the objectives of acquiring and utilizing highly qualified personnel as project managers. (Author)

AD-785 938/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
IMPROVEMENT OF THE IMAGE REPRODUCTION PRECISION IN THE PREPARATION OF DIAPOSITIVES,
O. V. Portnova. 7 Nov 73, 8p Rept no. FSTC-HT-23-0996-73
Trans. of Geodeziya i Kartografiya (USSR) n5 p44-47 1972.

Descriptors: *Contact printers, *Stereophotography, Photographic images, Aerial photography, Distortion, Errors, Translations, USSR.

The authors analyze the distortions and errors which occur in photograph images during printing on a KPU-1 contact printer and propose a method whereby these can be reduced.

AD-785 951/5GA PC$4.75/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE IMPACT OF PREFERENTIAL MILITARY SPENDING IN AREAS OF HIGH EMPLOYMENT.
Master's thesis,
Charles R. Spinner, and Richard E. Young. Aug 74, 91p Rept no. SLSR-12-74B

Descriptors: *Military procurement, Contracts, Economics, Manpower, Employment, Labor, Theses.
Identifiers: *Depressed areas, Unemployment.

Preferential spending by the Department of Defense, in areas of high unemployment, is one of several social content programs designed to enhance the nation's economy. This program, which has been in operation since 1952, attempts to cause improvements in the rate of employment in those areas of the United States that are experiencing a level of unemployment substantially above the national average. Two controversial aspects of the implementation of this program are that there will be no price differentials and only a portion of the contract will be preferentially awarded to a firm located in an area of high unemployment. This thesis investigates the developments which led to the implementation of the program and statistically tests the effectiveness of the program in terms of reduced unemployment rates resulting from preferential spending. (Modified author abstract)

AD-785 953/1GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
THE DEVELOPMENT OF A PREDICTIVE MODEL FOR FIRST UNIT COSTS FOLLOWING BREAKS IN PRODUCTION.
Master's thesis,
Allen A. Pichon, Jr., and Charles L. Richardson. Aug 74, 115p Rept no. SLSR-15-74B

Descriptors: *Air Force procurement, *Logistics planning, *Costs, Spare parts, Production, Learning curves, Mathematical prediction, Standard deviation, Theses.
Identifiers: *Break in operations.

While the learning curve has received increased emphasis from private industry and the United States Air Force (USAF), an associated phenomenon, the break in production and its effect on follow-on first unit costs has received little formal attention. Since a major activity of USAF is the procurement of spares or parts after initial production of a weapon system is completed, the need for a model to predict first unit costs following a break in production is evident. This thesis developed such a model relative to a machine-shop environment. Through the use of a computer stepwise regression program, a model was determined to predict first unit direct costs after a break in production. (Modified author abstract)

AD-786 215/4GA PC$6.25/MF$2.25
Operations Research Inc Silver Spring Md
EXAMINATION OF MISSION CATEGORIES OF GENERAL SUPPORT AND LOGISTICS. VOLUME II. DATA ANALYSIS, EXAMINATION, AND FORMATTING.
Technical rept. 10 Sep 73-30 Apr 74,
Robert T. Mason, Don L. Braddy, Lee S. Bratton, R. Malcom Fortson, and D. C. Bruton. 30 Apr 74, 168p Rept no. ORI-TR-833-Vol-2
Contract N00014-74-C-0104
See also Volume 1, AD-782 626.

Descriptors: *Naval logistics, *Logistics support, Logistics planning, Military budgets, Naval procurement, Naval vessels, Naval shore facilities, Naval operations, Maintenance, Data processing.
Identifiers: SLEDS(Support and Logistics Enumeration and Definition Studies), Support and logistics enumeration and definition studies, *Logistics management, *Maintenance support.

The study examined the following specific major mission categories of General Support and Logistics: Functions performed; for whom; sources expended; the relationship between functions to force levels, operations and/or procurement. Interviews were conducted with key budget personnel in the Naval Air Systems Command, Naval Ship Systems Command, Naval Facilities Command, Naval Ordnance Systems Command, Naval Electronics Systems Command, Office of Navy Comptroller, Office of the Chief of Naval Operations and the Office of the Commander-in-Chief, Atlantic. Based on these interviews, data was collected, examined and formatted. Additionally, correlation analyses were performed to determine the extent to which the cost categories were examined. (Author)

AD-786 285/7GA PC$4.25/MF$2.25
Army Materiel Command Texarkana Tex Intern Training Center
PLANT LAYOUT PLANNING FOR THE RED RIVER ARMY DEPOT TIRE SHOP.
Final rept.,
Jimmy D. Bunyard. Mar 73, 67p Rept no. USAMC-ITC-2-73-05

Descriptors: *Depots, *Tires, *Planning, Modification, Mechanical drawings, Production engineering, Military facilities.

The layout planning study iterates and explains the steps necessary to accomplish the layout of a new facility or the re-layout of an existing production plant. Through the performance of these steps a new design for the Red River Army Depot Tire Rebuild Shop is developed. In addition, a quantitative evaluation of the new layout is presented. (Author)

15F. Nuclear Warfare

AD-785 956/4GA PC$5.25/MF$2.25
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Systems and Logistics
SENSITIVITY OF CONFLICT SIMULATION MODELS TO CHANGES IN VARIABLE PARAMETERS.
Master's thesis,
William G. Sheehan, and Paul E. Scherck. Aug 74, 103p Rept no. SLSR-27-74B

Descriptors: *Nuclear warfare, *Game theory, Tactical warfare, Lanchester equations, Mathematical models, Computer programs, Theses.
Identifiers: *Sensitivity analysis.

Mathematical modeling is the primary means for studying the escalation of tactical nuclear warfare. The strength of the findings using such models is directly related to the integrity of the model and the values of the parameters used therein. The sensitivity of the model to changes in initial parameters provides some measure of the criticality of the parameters selected.

SAND-74-0029 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
ASSURANCE OF STOCKPILE QUALITY THROUGH STOP-RULE SAMPLING.
J. R. Ellefson. Jul 74, 13p
Contract AT(29-1)-789

Descriptors: (*Nuclear weapons, *Quality control), Equations, Mathematical models, Nomograms, Quality assurance, Reliability, Sampling, Testing.

For abstract, see NSA 30 08, number 23475.

15G. Operations, Strategy, and Tactics

AD-786 023/2GA PC$5.25/MF$2.25
Rand Corp Santa Monica Calif
PROBE I: A DIFFERENTIAL EQUATION MODEL FOR COMPARING FIGHTER ESCORT AND AIRBASE ATTACK SYSTEMS IN A COUNTER-AIR OPERATION.
Final rept.,
F. A. Tatum, and L. N. Rowell. Jul 74, 122p Rept no. R-1413-PR
Contract F44620-73-C-0011

Descriptors: *Tactical bombing, *Bomber aircraft, *Antiaircraft defense systems, Penetration, Mission profiles, Interception probabilities, Kill

probabilities, Mathematical models, Computer programming.
Identifiers: PROBE I computer program, IBM 370/158 computers.

PROBE I models an attack air force versus an interceptor defense in a conflict extending over as many as thirty missions. For any mission, the attack sorties may be allocated to any combination of (1) aircraft with bombs only, assigned to prime targets, (2) similar aircraft targeting hostile interceptor bases, or (3) aircraft with only air-combat weapons that defend the bombers. The model shows the results of one or a series of missions in which the experimenter specifies the allocations; alternatively, it can determine, mission-by-mission, the allocations that (with the total number of missions specified) will maximize a given objective, such as 'total bomb tonnage reaching prime targets.' The heart of the model is a set of differential equations that reprsent the rates at which aircraft change from one state to another, e.g., loaded to unloaded – engaged to disengaged, etc. PROBE I is programmed for the IBM 370/158. (Author)

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-785 852/5GA PC$3.25/MF$2.25
Naval Ordnance Lab White Oak Md
DESIGN OF A FREQUENCY-LOCK LOOP FOR PADD II (NSAP PROJECT EC-172).
Final rept.,
Arthur D. Delagrange. 25 Jun 74, 18p Rept no. NOLTR-74-122

Descriptors: *Loops, Sonar, Doppler systems, Frequency, Voltage controlled oscillators, Tracking, Acquisition, Circuits.
Identifiers: *Frequency locked systems.

The report describes the design of a frequency-lock loop for the PADD II harbor patrol sonar. It will be of interest to those familiar with PADD II. It may also be of interest to persons working with automatic frequency acquisition, frequency tracking, or phase-lock loops.

AD-785 875/6GA PC$4.25/MF$2.25
Underwater Systems Inc Silver Spring Md
SUS QUALITY ASSESSMENT,
Marvin S. Weinstein, and Richard J. Hecht. 5 Jun 74, 52p
Contract N00014-73-C-0484

Descriptors: *Underwater sound generators, Underwater sound, Sound transmission, Quality assurance, Acoustic waves, Data acquisition.
Identifiers: SUS(Signals Underwater Sound), Signals underwater sound, SUS bombs.

The detonation pressure time curves recorded aboard the shooting ships, the USNS Silas Bent and the USNS Bartlett, were processed to acquire quality assurance statistics for the SUS used for acoustic sources. Bubble pulse periods were determined for each detonation from which an equivalent detonation depth was derived. For statistical purposes, the detonation depths are grouped in 2 foot classes centered on the even foot for the MK 61 (60 feet) and 10 foot classes centered on the decade, for the MK 82 (300 feet). (Modified author abstract)

AD-785 902/8GA PC$4.75/MF$2.25
Texas Univ Austin Applied Research Labs
FINAL REPORT.
Rept. for 5 Jan 70-31 Dec 72,
Glen E. Ellis, Jack A. Shooter, and Terry D. Plemons. 31 Dec 72, 83p Rept no. ARL-TR-72-52
Contract N00024-70-C-1184
See also AD-753 846.

Descriptors: *Signal processing, *Reverberation, *Sonar signals, Fourier transformation, Narrowband, Intensity, Underwater sound.
Identifiers: *Cepstrum techniques.

The two research tasks performed under the Contract are described in Parts I and II of this report. Part I is a description of the investigation of cepstrum processing techniques as applied to active sonar. Part II describes the statistical study of narrowband reverberation processes. (Modified author abstract)

AD-786 239/4GA PC$4.25/MF$2.25
Westinghouse Electric Corp Pittsburgh Pa Research and Development Center
LRAPP VERTICAL ARRAY. PHASE II.
Technical rept. 12 Feb 72-31 Mar 73,
C. H. Jones. 13 Jun 73, 68p
Contract N00014-72-C-0120
See also AD-900 477.

Descriptors: *Acoustic arrays, Hydrophones, Noise(Sound), Oceans, Underwater sound, Vertical orientation, Transducers, Oceanographic equipment, Ambient noise.

A vertical array of six hydrophones on a 13,050 ft. cable was built for measuring noise in the ocean over the frequency band from 10 Hz to 300 Hz. The hydrophones have a high sensitivity to acoustic signals. They have a low self noise and a low sensitivity to acceleration. The small size and ruggedness of the connector hydrophone makes it practical to wind the entire array onto a drum so that it can be deployed and retrieved with a minimum amount of handling. Special watertight connectors were designed that fit inside a pair of split cylinders which mechanically couple each hydrophone to the cable sections. This permits the replacement of a hydrophone simply by uncoupling the split couplers, unplugging the old hydrophone and plugging in the new hydrophone. (Author)

17B. Communication

AD-785 738/6GA PC$5.75/MF$2.25
Stanford Research Inst Menlo Park Calif
SPEECH DIGITIZATION BY LPC ESTIMATION TECHNIQUES.
Annual technical rept. 3 Oct 72-31 Mar 74,
D. T. Magill, and C. K. Un. Jul 74, 142p*
Contract DAHC04-72-C-0009, ARPA Order-1943

Descriptors: *Speech recognition, *Voice communications, *Coding, Secure communications, Waveforms, Synthesis, Estimates, Pitch discrimination, Vocoders.

This study is aimed at the broad goal of the DoD Secure Voice Consortium to develop hardware models of improved narrow-band voice coders. The study is focused on the 'pitch and voicing' problem. The objective is to conceive and demonstrate the feasibility of two or more improved strategies to estimate and encode the excitation parameters of human speech. The decoded parameters will be used to excite a time-varying vocal tract 'filter' in the synthesizer.

AD-785 780/8GA Reprint
Pennsylvania State Univ University Park Dept of Electrical Engineering
THE EFFECT OF SPECTRAL SHAPE ON THE PROBABILITY OF ERROR IN LASER BINARY COMMUNICATIONS SYSTEMS,
Gerard Lachs, and Neil F. Ruggieri. 12 Sep 72, 6p
AROD-8936.7-E
Contract DAHC04-70-C-0056
Prepared in cooperation with McDonnell Douglas Astronautics Co., St. Louis, Mo.
Availability: Pub. in IEEE Transactions on Aerospace and Electronic Systems, vAES-9 n6 p860-863 Nov 73.

Descriptors: *Laser communications, Pulse communications, Errors, Probability, Spectra, Signal to noise ratio.

The effect of spectral bandwidth and spectral shape upon laser binary communication systems is investigated. The probability of error is plotted as a function of bandwidth for Lorentzian and Gaussian shaped spectra. The results show that even when the average noise power and the signal-to-noise ratio are held constant, the probability of error varies considerably as a function of spectral bandwidth. (Author)

AD-786 034/9GA PC$7.00/MF$2.25
Air Force Academy Colo
A PRIMER IN STRATEGIC COMMAND AND CONTROL COMMUNICATIONS.
Research rept.,
John B. Tindall, Carter M. Glass, Nicholas G. Gionis, Anthony K. Hyder, Jr., and James H. Head. Jun 73, 189p Rept no. USAFA-RR-73-5

Descriptors: *Nuclear warfare, *Command and control systems, *Strategic communications, Communications traffic, Secure communications, Communications networks, Blackout(Propagation), Early warning systems, Nuclear explosion damage, Mathematical models.
Identifiers: Strategic command and control communications.

This document is intended as a first look at Strategic Command and Control Communications (SC3). It attempts to answer the questions which arise quickly for the engineer newly charged with investigations in this area. Thus, Chapter I introduces the missions of strategic communications and suggests the complexities of the SC3 network. Chapter II covers communication systems and propagation phenomena. Chapter III discusses nuclear effects as related to communications. The last three chapters are more technical and require a previous foundation if they are to be meaningful. Probability Theory, Network Theory, and Modeling Concepts are covered in this section. Finally, two appendices include an extensive glossary of acronyms and a set of charts which collectively describe the macro-aspects of the SC3 network. (Author)

AD-786 037/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
EXPERIENCE GAINED IN TRANSMITTING A CARTOGRAPHIC IMAGE BY PHOTOTELEGRAPH,
I. I. Maksimov, and N. P. Maksimov. 24 Apr 74, 8p Rept no. FSTC-HT-23-0156-74
Trans. of Geodeziya i Kartografiya (USSR) n2 p58-61 Feb 73.

Descriptors: *Mapping, *Photographic images, *Transmission lines, Facsimile transmission, Facsimile equipment, Processing, Translations, USSR.

The report is an article dealing with the transmission of a cartographic image by phototelegraph. The quality of image transmitted in this way is entirely satisfactory, and can be used in cartographic production and analysis of cartographic material. Some method for compressing the information must be found to reduce time and costs.

AD-786 129/7GA PC$3.75/MF$2.25
Signals Research and Development Establishment Christchurch (England)
A 4800 BITS/SEC ADAPTIVE PCM SPEECH CODER,
R. M. Wilkinson. Sep 73, 27p Rept no. SRDE-73031 DRIC-BR-41301

Descriptors: *Coders, Speech, Adaptive systems, Pulse code modulation, Digital systems, Pulse communications, Telephone systems, Analog to digital converters, Great Britain.

A speech coder is described which enables telephone speech signals to be transmitted over a 4800 bits/sec digital channel. The principle is that of a pulse code modulator which uses only one bit to code each sample. This bit represents the polarity of the sample. In addition, information is transmitted about the amplitude of the speech signal envelope. The speech quality achieved is low, but provides a usable communication channel. The system may be useful in situations where low bit rate digital transmission is necessary using simple coding equipment.

AD-786 155/2GA PC$4.75/MF$2.25
Collins Radio Co Dallas Tex
PACKET RADIO COMMUNICATIONS.
Quarterly technical rept.,
F. H. Dickson. 30 Sep 74, 80p Rept no. 523-0699813-001C3L
Contract DAHC15-73-C-0192, ARPA Order-2305
See also report dated 17 Apr 74, AD-778 345, and AD-778 344.

Descriptors: *Radio links, Spread spectrum, Coding, Multiple access, Data transmission systems, Synchronism, Data rate, Switching, Correlation techniques.
Identifiers: Packet radio Communications.

Three major areas of activities in support of packet radio communications are reported in this document. These are: (1) Analysis of the pseudorandom code spread spectrum technique, (2) evaluation and selection of the pseudorandom codes for the experimental repeater, and (3) development of a signal capture model. The analysis of the code spread spectrum includes considerations of synchronization and multiple access capabilities. The code selection is based on the computer-derived side lobe properties and cross-correlation of high data rate codes with low data rate codes. The developed capture model is based on the repeater design currently being developed and will be used to model capture in the existing packet radio network simulation models, which presently have no capture. Also, a brief status report of the repeater equipment development is included in the introduction. (Author)

AD-912 656/6GA PC$6.25/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
INTERFACE STANDARDS AND COMPATIBILITY MATRIX FOR SHIPBOARD COMMUNICATIONS EQUIPMENT. VOLUME 2. VHF/UHF,
J. L. Lievens, and C. W. Tirrell. May 73, 168p
NELC-TD-181-Vol-2
Distribution Limitation now Removed.

Descriptors: *Communication equipment, *Electromagnetic compatibility, Communication and radio systems, Radiofrequency interference, Radio equipment, Very high frequency, Ultrahigh frequency, Radio transmitters, Radio receivers, Interfaces, Naval procurement, Shipboard, Ship antennas, Coupling circuits, Antenna components, Transmitter receivers, Radiofrequency amplifiers, Standards.

This document supplies the information essential to the systematic design of ship communication systems. It brings together data on the most recent equipments available for shipboard use, shows the interrelation between them, and defines areas of incompatibility between equipments. The information supplied will enable the systems engineer to specify available compatible equipments for an effective systems design. Volume 1 provided guidance in high-frequency receiving and transmitting system design. Volume 2 covers VHF/UHF.

AD-915 852/8GA PC$5.75/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
PROCEEDINGS OF THE SYMPOSIUM ON SPREAD SPECTRUM COMMUNICATIONS (1973) HELD AT NAVAL ELECTRONICS LABORATORY CENTER, SAN DIEGO, CALIFORNIA 92152, 13-16 MARCH 1973. VOLUME I.
Technical document.
Mar 73, 129p NELC-TD-271-Vol-1
See also Volume 2, AD-528 360. Distribution Limitation now Removed.

Descriptors: *Spread spectrum, *Communication radio systems, *Information theory, Spread spectrum, Symposia, Radio antijamming, Frequency agility, Time division multiplexing, Jamming, Synchronization(Electronics), Multipath transmission, Radio signals, Frequency synthesizers, Digital filters, Matched filters, Phase locked systems, Modulation, Tracking, Acoustic waves, Frequency shift keyers, Phase shift circuits, Command and control systems, Remotely piloted vehicles, Secure communications, High frequency, Air traffic control systems.
Identifiers: *Frequency hopping.

Contents: Keynote address; Spread spectrum concepts; Opening day comments; Effective acquisition of FH TDMA signals in jamming; A unified description and design format for spread spectrum waveforms; Signal design for synchronization and multipath resolution in delay-spread channels; Optimal frequency hopping sequences for multiple access; Fast frequency hopping techniques; Synchronization of a frequency hopped spread spectrum signal; Fast frequency hopping synthesizer; Increasing the utility of the digital matched filter.

JPRS-62078 PC$7.00/MF$2.25
Joint Publications Research Service, Arlington, Va.
SCIENTIFIC AND TECHNICAL CONFERENCE ON PROBLEMS OF LONG-DISTANCE COMMUNICATIONS, DATA TRANSMISSION, TELEGRAPHIC COMMUNICATIONS, AND LINE AND CABLE EQUIPMENT, 24-26 MARCH 1971.
23 May 74, 193p
Trans. of Nauchno-Tekhnicheskaya Konferentsiya po probleman Dalnei Svyazi, Peredachi Dannykh, Telegrafnoi Svyazi i Lineino-Kabelnykh Sooruzhenni, Moscow, 24-26 Mar 71. Papers, Kiev, 1971 132p.

Descriptors: *Telecommunication, *Meetings, Data transmission, Telegraph systems, Communication cables, Transmission lines, Telephone systems, Translations, USSR.

The report contains papers read at the conference on long-range communications, data transmission, telegraphic communications, and line and cable equipment.

JPRS-62686 PC$4.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
ABSTRACTS OF 1974 ALL-UNION RADIO DAY SCIENTIFIC MEETING.
A. I. Viches, V. B. Minukhin, M. V. Gitlits, G. S. Krinchik, and M. B. Khaletskii. 9 Aug 74, 94p
Trans. of mono. Vsesoyuznaya Nauchnaya Sessiya, Posvyashchennaya Doyu Radio, Annotatsii i Tezisy Dokladov, Moscow, 1974 pl-64.

Descriptors: *Radio communication, *Recording instruments, *Meetings, Radio broadcasting, Magnetic recording, Radio receivers, Amplifiers, Antennas, Abstracts, Translations, USSR.

The report contains annotations and topics of reports on radio-broadcasting, electroacoustics and sound recording, radio receivers and amplifiers, and antennas.

JPRS-62704 PC$4.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
SCIENTIFIC MEETING ON ALL-UNION RADIO DAY, ABSTRACTS OF REPORTS,
V. M. Dmitrachenko, V. F. Suchkov, V. I. Kirillov, V. N. Gordiyenko, and V. N. Slashchev.
12 Aug 74, 91p
Trans. of memo. Vsesoyuznaya Nauchnaya Sessiya, Posvyashchennaya Dnyu Radio, Annotatsii i Tezisy Dokladov, Moscow, 1974 pl-64.

Descriptors: *Telecommunication, *Meetings, Mail, Multichannel communication, Wave propagation, Waveguides, Communications management, Documents, Translations, USSR.

The report contains annotations and topics of reports on multichannel communications, production communications, waveguides, postal communications and soyuzpechat' main administration for the distribution of publications.

JPRS-62920 PC$7.50/MF$2.25
Joint Publications Research Service, Arlington, Va.
PRICE LIST NO. 45 FOR THE REAPPRAISAL OF SPECIALIZED COMMUNCIATIONS, RADIO AND TELEVISION EQUIPMENT AS OF 1 JANUARY 1973,
A. A. Konarevskii, and V. I. Dotsenko. 9 Sep 74, 243p
Trans. of mono. Tsennik No. 45 dlya Pereitsenki Spetsializirovannogo Oborudovaniya Svyazi, Radio i Televideniya na 1 Yanvarya 1973 G, Moscow, 1972 352p.

Descriptors: *Communication equipment, Prices, Radio equipment, Television equipment, Translations, USSR.

The report contains a price list for reappraisal of the status as of 1 January 1973 of specialized communications, radio broadcasting and television equipment used by educational institutions, scientific institutes and other institutions and orgaizations that are maintained on the state budget.

N74-29494/3GA PC$9.75/MF$2.25
Technische Universitaet, Munich (West Germany).
NEW PRINCIPLES OF TIME MULTIPLEXING AND CODING FOR IMPROVED TRANSMISSION QUALITY OF A PCM SYSTEM FOR LONG DISTANCE TELEPHONE SIGNALS NEUE PRINZIPIEN FUER ZEITMULTIPLEX UND CODIERUNG ZUR VERBESERUNG DER UEBERTRAGUNGSGUALITAET EINES PCM-SYSTEMS FUER FERNSPRECHSIGNALE.
Ph.D. Thesis.
W. Fruehauf. 1973, 132p
Language in German.

Descriptors: *Pulse code modulation, *Telephony, *Time division multiplexing, Analog to digital converters, Noise reduction, Voice data processing.

For abstract, see STAR 1219

N74-29497/6GA PC$8.75/MF$2.25
Radio Corp. of America, Princeton, N.J.
GROUND-COMMANDED TELEVISION ASSEMBLY (GCTA).
Final Report.
29 Dec 72, 114p NASA-CR-134351, R-3901-F
Contract NAS9-11260

Descriptors: *Apollo project, *Lunar exploration, *Television equipment, *Television systems, Apollo 15 flight, Apollo 16 flight, Apollo 17 flight, Data transmission, Television transmission.

For abstract, see STAR 1219

N74-29499/2GA PC$7.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TRACKING AND DATA RELAY SATELLITE SYSTEM (TDRSS), USERS' GUIDE.
10 Jun 74, 79p NASA-TM-X-70710, X-805-74-176

Descriptors: *Data transmission, *Satellite networks, *Satellite tracking, Manuals, Satellite ground support, Satellite transmission, Telecommunication.

For abstract, see STAR 1219

N74-29771/4GA PC$4.75/MF$2.25
Australian Post Office Research Labs., Melbourne. Research Labs.
AN INSTRUMENTATION SYSTEM FOR 150 MBIT/S DIGITAL TRANSMISSION SYSTEMS.
A. Y. C. Quan. Dec 73, 32p REPT-6819

Descriptors: *Data transmission, *Digital systems, Breadboard models, Data processing equipment, Digital data, Pulse code modulation.

For abstract, see STAR 1219

N74-30533/5GA PC$4.50/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AN APPLICATION OF QUEUEING THEORY TO THE DESIGN OF CHANNEL REQUIREMENTS FOR SPECIAL PURPOSE COMMUNICATIONS SATELLITES.
Ph.D. Thesis.
G. F. Hein. Aug 74, 111p NASA-TM-X-71590

Descriptors: *Communication satellites, *Queueing theory, Channels, Mathematical models, Poisson equation.

For abstract, see STAR 1220

N74-30534/3GA PC$11.25/MF$2.25
Alabama A & M Univ., Huntsville. School of Technology.
ANALYSIS OF THE PROPOSED UTILIZATION OF TDRS SYSTEM BY THE HEAO-C SATELLITE.
Final Report.
G. Weathers. 29 May 74, 165p NASA-CR-139393
Contract NGR-01-001-021

Descriptors: *Heao, *Tdr satellites, *Telecommunication, Cost estimates, Ground support equipment, Satellite tracking.

For abstract, see STAR 1220

PAT-APPL-482 953 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
APPARATUS FOR SIMULATING OPTICAL TRANSMISSION LINKS.
Patent Application.
M. W. Fitzmaurice, and M. Tycz. Filed 25 Jun 74, 20p NASA-CASE-GSC-11877-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Links, *Modulators, *Optical equipment, Analog computers, Computerized simulation, Low pass filters, *Patent applications, Signal processing, Transmitters.

A space-to-space or space-to-earth optical transmission link is simulated by positioning a linear optical modulator between an opical carrier source and a receiver for the carrier. The optical modulator is driven by an analog signal having random variations indicative of characteristics of the transmission link, as derived from an analog computer circuit. The analog computer circuit is responsive to a Gaussian random analog source. For certain types of links, the analog computer circuit is responsive to a pair of Gaussian analog signals which are derived by feeding a relatively wide band Gaussian analog source in parallel to a first low pass filter and to a heterodyne circuit. For space-to-space transmission, transmitter pointing jitter is a dominant noise source and is simulated by deriving a beta statistical variation from the analog computer.

PAT-APPL-492 077 PC$3.25/MF$2.25
Department of the Air Force Washington D C
SYSTEM CHANNEL DISTORTION WEIGHTING FOR PREDETECTION COMBINERS.
Patent application,
Olindo A. Tagliafessi. Filed 26 Jul 74, 14p Rept no.

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Radio receivers, Patents, Distortion, Tropospheric scatter communications, Signal processing.
Identifiers: Carrier to noise ratio, *Patent applications, PAT-CL-326-349.

The patent application describes a tropo system channel distortion weighting apparatus for predetection combiners for modifying the predetection combiner algorithm to improve the output carrier to noise ratio in the presence of signal distortion.

PATENT-3 828 137 Not available NTIS
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
DIGITAL COMMUNICATION SYSTEM.
Patent.
L. G. Monford, Jr. Patented 6 Aug 74, 10p PAT-APPL-310 034
Misc-Filed 28 Nov. 1972 Supersedes N73-12151 (11 - 03, p 0266).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Digital techniques, *Telephony, *Transmitter receivers, *Voice data processing, Communication equipment, *Patents, Space communication, Synchronizers, Voice communication.
Identifiers: PAT-CL-179-15-AT.

A digital communication system is reported for parallel operation of 16 or more transceiver units with the use of only four interconnecting wires. A remote synchronization circuit produces unit address control words sequentially in data frames of 16 words. Means are provided in each transceiver unit to decode calling signals and to transmit calling and data signals. The transceivers communicate with each other over one data line. The synchronization unit communicates the address control information to the transceiver units over an address line and further provides the timing information over a clock line. A reference voltage level or ground line completes the interconnecting four wire hookup.

PATENT-3 828 138 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
COHERENT RECEIVER EMPLOYING NONLINEAR COHERENCE DETECTION FOR CARRIER TRACKING.
Patent.
W. C. Lindsey, and M. K. Simon. Patented 6 Aug 74, 12p PAT-APPL-359 039
Misc-Filed 10 May 1973 Supersedes N73-23118 (11 - 14, p 1620). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Nonlinear feedback, *Phase coherence, *Receivers, *Telecommunication, Oscillators, *Patents, Phase control, Tracking networks, Voltage regulators.
Identifiers: PAT-CL-179-15-BC.

The concept of nonlinear coherence employed in carrier tracking to improve telecommunications efficiency is disclosed. A generic tracking loop for a coherent receiver is shown having seven principle feedback signals which may be selectively added and applied to a voltage controlled oscillator to produce a reference signal that is phase coherent with a received carrier. An eighth feedback signal whose nonrandom components are coherent with the phase detected and filtered carrier may also be added to exploit the sideband power of the received signal. A ninth feedback signal whose nonrandom components are also coherent with the quadrature phase detected and filtered carrier could be additionally or alternatively included in the composite feedback signal to the voltage controlled oscillator.

PB-234 506/4GA PC$3.25/MF$2.25
Federal Communications Commission, Washington, D.C. Office of the Chief Engineer.
MAN-MADE NOISE SURVEY.
Jules Deitz. 28 Oct 64, 12p FCC-OCE-R64-12

Descriptors: *Manmade rediofrequency interference, Surveys.

The purpose of the paper is to discuss some of the important problems that require solution if a manmade noise survey is to be both feasible and meaningful. It is intended to be used as a starting point for discussions which could lead to a survey design that is acceptable to a majority of interested parties. Interested parties, in this case, would be experts in the field of noise measurements in both industry and government who believe that manmade noise survey is worthwhile if it can be conducted in an acceptable manner.

17G. Navigation and Guidance

AD-785 625/5GA PC$3.25/MF$2.25
Army Engineer Topographic Labs Fort Belvoir Va
RECENT TRANSLOCATION RESULTS USING NAVIGATION SATELLITES,
Frederick M. Gloeckler, Jr. 1972, 15p

Descriptors: *Position finding, Position(Location), Navigation satellites, Radio receivers.
Identifiers: *Translocation, AN/PRR-14, AN/PRN-6(XN-1).

Translocation, as applied by users of the Navy Navigation Satellite System (NNSS), is a procedure used to position one receiver with respect to another using data acquired simultaneously by both receivers. The translocation process minimizes the effect of system error sources which are highly correlated at both receiver sites. The paper presents test results for an improved class of translocation equipment. Accuracy improvement, by a factor of three, was shown for short distances.

AD-785 640/4GA PC$3.25/MF$2.25
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala
COMPLIANT SURFACES FOR AIR BEARING GYROS,
James V. Johnston. 1969, 16p

Descriptors: *Gyroscopes, *Gas bearings, Spin stabilized rockets, Elastomers, Rubber seals, Hydrostatics, Experimental design, Tolerances(Mechanics).

This paper contains the results of a development study on a spherical, hydrostatic, compliant bearing for a directional gyro. The concept of the rubber air bearing and its subsequent development is traced through its analytical analysis and experimental hardware fabrication to the test results. Use of a compliant material for one of the bearing surfaces, which would grip the rigid surface when unpressurized, constitutes the novel concept of self-caging. Included in this paper are the basic design curves developed for the compliant bearing. Use of these curves provides the bearing engineer with the basic tools necessary to design compliant air bearings. Unusual problems encountered in the fabrication and evaluation of rubber bearings are shown and discussed. Areas of further investigation are indicated which would enhance the rubber bearing development technologies. (Author)

AD-785 677/6GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
LARGE AMPLITUDE MOTION OF A LIQUID FILLED GYROSCOPE: NON-LINEAR INTERACTION OF INERTIAL AND ROSSBY WAVES,
Wayman E. Scott. 1969, 16p

Descriptors: *Gyroscopes, Motion, Liquids, Interactions, Inertial systems, Rossby waves.

AD-785 733/7GA PC$5.25/MF$2.25
Rockwell International Corp Anaheim Calif Autonetics Div
MICRON FAST REACTION AND HIGH TEMPERATURE OPERATION DEVELOPMENT.
Final technical rept. 1 Jul 73-30 Jun 74,
H. L. Bump, J. F. Klinchunch, and A. P. Andrews. Jun 74, 118p Rept no. C73-1058/201 ECOM-0188-F-73
Contract DAAB07-73-C-0188

Descriptors: *Inertial navigation, *Gyroscopes, Reaction time, High temperature, Alignment, Damping, Gyro compasses.
Identifiers: MICRON navigation system.

The objective of the program is to provide a fast reaction capability and to investigate a high temperature operation capability for the MICRON system. Changes were made to the MICRON system gyros and electronics to allow the fast reaction time needed. An ECOM motor and spin motor power supply were developed and tested. The redesigned motor achieved the goal of 80F/min rotor warm-up rate, a 9 sec spin up capability, a 20 sec polhode damping capability and a 30 sec rapid spon-down capability. In addition, rotor gap modeling was shown to be a feasible method for solving the rapid turnaround problem. The results of high temperature testing of the electronics are given and discussed. (Modified author abstract)

AD-785 859/0GA PC$5.25/MF$2.25
Rome Air Development Center Griffiss AFB N Y
FAA LIGHTNING PROTECTION STUDY: LIGHTNING PROTECTION REQUIREMENTS FOR AN/GRN-27(V) INSTRUMENT LANDING SYSTEM.
Final rept. Nov 72-31 Jan 74,
Gene K. Huddleston, John D. Nordgard, and Ronald W. Larson. Apr 74, 120p FAA-RD-74-131
Contract DOT-FA72WAI-356
See also AD-781 319.

Descriptors: *Instrument landings, *Lightning arresters, Transients, Surges, Protective equipment, Radio equipment, Semiconductor devices.
Identifiers: Instrument landing systems, AN/GRN-27(V).

The withstand capabilities and protection requirements for solid state circuits of the AN/GRN-27 (V) Instrument Landing System susceptible to lightning-induced transients on buried control cables are presented. Susceptible circuits and components were identified from the wiring diagrams as transistors, diodes, relay contacts, and electrolytic capacitors. Withstand capabilities of each circuit were determined analytically using manufacturer's data and a 1000-volt, 10 x 1000 microsec test waveform. Avalanche diode surge protectors and series resistance are recommended to protect susceptible circuits from lightning-induced transients on buried control cable conductors connected to the circuits.

AD-786 207/1GA PC$3.75/MF$2.25
Naval Electronic Systems Test and Evaluation Detachment Patuxent River Md
CERTIFICATION TEST PROCEDURES FOR AIRCRAFT APPROACH CONTROL AN/SPN-41.
1 Feb 74, 32p

Descriptors: *Radar landing control, Aircraft carriers, Approach, Test equipment, Carrier controlled approach radar.
Identifiers: AN/SPN-41.

Aircraft Approach Control AN/SPN-41, composed of shipboard and airborne equipments, can be used as an independent landing aid or as a Mode I monitor on AN/SPN-42 equipped carriers. In order to satisfactorily accomplish this monitoring, each piece of equipment must operate within allowable tolerances. The tests are designed to provide the criteria for initial and periodic checks of the system to ensure operation within acceptable limits. There are three categories of certification tests. Category I tests are the basic equipment tests. Category II tests are pierside flights to check the system alignment and correlation of the AN/SPN-41 with the AN/SPN-42, the AN/SPN-35, and the FLOLS (Fresnel Lens Optical Landing System). Category III tests are the at-sea flight tests using aircraft equipped to record data.

AD-786 272/5GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
DEVELOPMENT OF A DISCRETE ADDRESS BEACON SYSTEM.
Quarterly technical summary rept. no. 10, 1 Apr-30 Jun 74.
1 Jul 74, 78p FAA-RD-74-136
Contracts F19628-73-C-0002, DOT-FA72WAI-261
See also report dated 1 Apr 74, AD-781 326.

Descriptors: *Air traffic control systems, *Radar beacons, *Data links, Antennas, Systems engineering, Detectors, Data processing, Avionics, Transponders.
Identifiers: DABS(Discrete Address Beacon Systems), Discrete address beacon systems, ATCRBS(Air Traffic Control Radar Beacon Systems), Air traffic control radar beacon systems.

The tenth Discrete Address Beacon System Quarterly Technical Summary covers the period 1 April through 30 June 1974. Included are the results to date of analytical studies, laboratory and flight experiments, and software developments supporting the concept feasibility and performance definition phase of the FAA DABS Program.

COM-74-50934/0GA MF$2.25
National Ocean Survey, Rockville, Md.
UNITED STATES COAST PILOT 4. ATLANTIC COAST CAPE HENRY TO KEY WEST. TWELFTH EDITION-JULY 1974.
1974, 272p NOAA-74090408
Paper copy available from National Ocean Survey, Rockville, Md. 20852. $2.50.

Descriptors: *Navigation, *Meteorological data, *Atlantic Coast, Oceanographic data, Oceanographic surveys, Navigational charts, Deep water terminals, Port regulations, Warning systems, Marine terminals, Waterways transportation, Cape Henry, Key West, Maps.
Identifiers: Intracoastal waterways.

United States Coast Pilots supplement the navigational information shown on the nautical charts and are based upon field inspections conducted by the National Ocean Survey, information published in Notices to Mariners, and reports from NOAA survey vessels, other Government agencies, State and local governments, maritime and pilotage associations, port authorities, mariners, and others. New editions are published about every five years after field inspections have been made by the National Ocean Survey to check reported information and to update published informations. In the intervening years, updated editions are published to include information reported to the National Ocean Survey. Coast Pilot 4, Atlantic Coast, Cape Henry to Key West, Twelfth (July 1974) Edition is an updated edition and includes the February to June 1969 field observations and other information.

N74-29500/7GA PC$9.50/MF$2.25
Westinghouse Electric Corp., Baltimore, Md.
ATS-5 RANGING RECEIVER AND L-BAND EXPERIMENT. VOLUME 2: DATA REDUCTION AND ANALYSIS.
Final Report.
Dec 71, 127p NASA-CR-139033
Contract NAS5-21598

Descriptors: *Ats 5, *Data reduction, *Range finders, *Statistical analysis, Position indicators, Ultrahigh frequencies, Very high frequencies.

For abstract, see STAR 1219

N74-30093/0GA PC$15.75/MF$2.25
Aerospace Systems, Inc., Burlington, Mass.
NAVIGATION AND GUIDANCE REQUIREMENTS FOR COMMERCIAL VTOL OPERATIONS.
Interim Technical Report.
W. C. Hoffman, W. M. Hollister, and J. D. Howell. Jan 74, 252p NASA-CR-132423, ASI-TR-74-17
Contract NAS1-12199

Descriptors: *Air navigation, *Aircraft guidance, *Commercial aircraft, *Vertical takeoff aircraft, Automatic landing control, Flight safety, Systems engineering, Terminal facilities.

For abstract, see STAR 1219

N74-30094/8GA PC$13.00/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
AIR TRAFFIC CONTROL SURVEILLANCE ACCURACY AND UPDATE RATE STUDY.
Final Report.
J. H. Craigie, D. D. Morrison, and I. Zipper. Mar 73, 198p NASA-CR-139043, TRW-18618-6004-RU-00
Contract NAS5-21603

Descriptors: *Air traffic control, *Aircraft guidance, *Approach control, *Flight safety, Accident prevention, Collision avoidance, Command and control.

For abstract, see STAR 1219

N74-30095/5GA PC$6.50/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
A STOL TERMINAL AREA NAVIGATION SYSTEM.
F. Neuman, and D. N. Warner, Jr.. May 74, 69p NASA-TM-X-62348

Descriptors: *Air navigation, *Landing aids, *Microwave equipment, *Short takeoff aircraft, *Terminal facilities, Approach control, Flight paths, Flight safety, Performance tests.

For abstract, see STAR 1219

N74-30096/3GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
LANDING APPROACH EVALUATION OF AN INTEGRATED CRT DISPLAY FOR GENERAL AVIATION AIRCRAFT.
P. D. Talbot, and G. W. Stinnett, Jr.. Jul 74, 15p NASA-TM-X-3096, A-5208
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Moffett Field, Calif.

Descriptors: *Aircraft landing, *Approach control, *Display devices, *General aviation aircraft, Aircraft instruments, Cathode ray tubes, Flight safety, Flight tests, In-flight monitoring.

For abstract, see STAR 1219

N74-30302/5GA PC$11.00/MF$2.25
Systems Research Lab., Champaign, Ill.

RESEARCH STUDY ON STABILIZATION AND CONTROL: MODERN SAMPLED-DATA CONTROL THEORY. CONTINUOUS AND DISCRETE DESCRIBING FUNCTION ANALYSIS OF THE LST SYSTEM.
Final Report.
B. C. Kuo, and G. Singh. 1 Jan 74, 158p NASA-CR-120331
Contract NAS8-29853

Descriptors: *Control moment gyroscopes, *Control stability, *Data sampling, *Discrete functions, *Functional analysis, *Large space telescope, Coefficient of friction, Computerized simulation, Nonlinearity, Torque.

For abstract, see STAR 1219

N74-30304/1GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A SYSTEM FOR SPACECRAFT ATTITUDE CONTROL AND ENERGY STORAGE.
J. D. Shaughnessy. Aug 74, 78p NASA-TN-D-7582, L-9271

Descriptors: *Energy storage, *Satellite attitude control, *Spacecraft electronic equipment, *Systems engineering, Attitude gyros, Computerized simulation, Gimbals, Mathematical models, Torquers.

For abstract, see STAR 1219

N74-31137/4GA PC$4.00/MF$2.25
Linguistic Systems, Inc., Cambridge, Mass.
POSSIBILITIES OF IMPROVING CONVENTIONAL INSTRUMENT LANDING SYSTEM (ILS).
H. Fricke. Aug 74, 20p NASA-TT-F-15609, DGLR-PAPER-73-017
Contract NASW-2482
Tran-Transl. Into English from the Dglr-Dgon Symp. On New Approach and Landing Techniques (Dusseldorf), 2-4 May 1973, Dglr-Paper-73-017 16 p.

Descriptors: *Flight safety, *Instrument landing systems, *Systems analysis, *Terminal facilities, Electromagnetic interference, Electromagnetic radiation, Frequency modulation, Polarization (Waves).

For abstract, see STAR 1220

N74-31154/9GA PC$24.25/MF$2.25
Saad (Geti), Karachi (Pakistan).
ANALYTICAL MECHANICS OF SYSTEMS WITH VARIABLE MASS.
V. S. Novoselov. Aug 74, 424p NASA-TT-F-15908
Contract NSF C-505
Tran-Transl. Into English of the Book "Analiticheskaya Mekhanika Sistem S Peremennymi Massami" Leningrad, Leningrad State Univ., 1969 p 1-240. Subm-Sponsored in Part by NASA.

Descriptors: *Mechanics (Physics), *Variable mass systems, Ballistics, Equations of motion, Gyroscopes.

For abstract, see STAR 1220

PAT-APPL-493 359 PC$4.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
AN IMPROVED SYSTEM FOR IMPOSING DIRECTIONAL STABILITY ON A ROCKET-PROPELLED VEHICLE.
Patent Application.
H. Perkins. Filed 31 Jul 74, 15p NASA-CASE-MFS-21311-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Rocket engine design, *Rocket vehicles, *Spacecraft stability, *Thrust vector control, Accelerometers, Hydraulic equipment, *Patent applications, Systems engineering.

An improved system for use in imposing directional stability on a rocket-propelled vehicle is discussed. The system includes a pivotally supported engine-mounting platform, a gimbal ring mounted on the platform and adapted to pivotally support a rocket engine, hydraulic actuator connected to the platform for imparting selected pivotal motion, an accelerometer and a signal comparator circuit for providing error intelligence indicative of aberration in vehicle acceleration, and an actuator control circuit connected with the actuator and responsive to error intelligence for imparting pivotal motion to the platform. A relocation of the engine's thrust vector is achieved for imparting directional stability to the vehicle.

17H. Optical Detection

AD-785 644/6GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
WIRE OBSTACLE DETECTION TECHNIQUE FOR ROTARY WING AIRCRAFT.
Alfred Kleider. 1973, 16p

Descriptors: *Helicopters, *Night flight, *Wire, *Detectors, Carbon dioxide lasers, Low altitude.

Aircraft night operations mission includes tasks employing helicopters for low level night operations. The special problem of detection and avoidance of wire obstacles at altitudes less than 100 feet has been researched. The latest laser development employs a pulsed CO2 Heterodyne system. Since laser systems employ narrow beams, the problems of field of view (FOV), repetition rate, and frame up date rate are closely related and dependent upon laser systems limitation in size, weight, and maximum output power achievable. Tests showed that under special conditions a pulsed laser illuminator with a Gated Low Light Level TV could detect wires at ranges up to 6000 feet. The display of such small objects at this range was beyond the normal expectations for an LLL TV.

AD-785 697/4GA PC$3.25/MF$2.25
Army Missile Command Redstone Arsenal Ala Physical Sciences Directorate
A NOVEL LASER RADAR RANGE.
E. L. Wilkinson, and R. L. Hartman. 1972, 16p

Descriptors: *Optical radar, *Ranges(Facilities), Lasers, Far field.

The paper shows (1) far field measurement of the laser radar return are necessary; (2)the validity of scaling laws, atmospheric complications of long ranges and deducing far field properties from near field measurements, make other solutions suspect; (3) the method of optically constructing the far field pattern can produce credible results independent of target properties. Using the optically constructed far field method, measurements can be made on a full scale target with flood lighting. Since the physical length of the range will be about fifty feet, the measurements can be made indoors in a controlled environment. This will eliminate problems caused by the atmosphere, weather and dust. Furthermore, such problems as acoustical vibrations, background and control of target motion are more easily controlled. The facility will be useful in test and development of laser radar systems and discrimination techniques. With a little imagination the facility could be useful in various other applications with only minor modification.

AD-785 710/5GA PC$4.75/MF$2.25
Bendix Research Labs Southfield Mich
CUEING SYSTEM FEASIBILITY STUDY.
Final rept.,
G. E. Busch. Aug 74, 78p Rept no. BRL-7264
Sponsored in part by Army Missile Command, Redstone Arsenal, Ala.

Descriptors: *Target acquisition, *Neodymium lasers, *Optical pumping, Photoflash lamps, Viewers, Combat surveillance, Yttrium aluminum garnet, Mobile, Army equipment, Display systems, Image converters, Television systems, Atmospheric motion, Illumination, Costs, Detectors.
Identifiers: Design.

The concept feasibility and proposed trial design of a very compact and low-cost laser cuer and hand-held viewer/receiver for target acquisition has been investigated. The concept utilizes a disposable neodymium-type laser pulser, to be directed at enemy targets by forward personnel, and a complementary viewer by a standoff weapons system. The laser concept features a photoflash-pumped neodymium:YAG laser which is not Q-switched. The design analysis indicates that the target cue can be visually superimposed as a light-spot on the operator's real-scene view, in true position and with adequate visual contrast. The viewer design permits the optional use of RF synchronization of the trigger pulse of a Q-switched laser used by the forward observer with the electronic gate in the image tube at the weapons delivery system. The analysis also includes consideration of signal-to-noise, weight, and specification projections, in addition to budgetary estimates of production costs for both the laser and the viewer. (Modified author abstract)

AD-786 032/3GA PC$6.25/MF$2.25
Mcdonnell Aircraft Co St Louis Mo
ACTIVE MULTISPECTRAL DATA ANALYSIS.
Final rept. May 73-May 74,
J. Carl Leader, David P. Owsley, and Charles R. Fulkerson. Aug 74, 171p RADC-TR-74-190
Contract F30602-73-C-0212

Descriptors: *Target discrimination, *Spectrum signatures, *Detectors, Gas lasers, Laser beams, Multispectral, Signal processing, Data acquisition, Digital systems, Computer programs, Electrooptics.

A study was conducted for the systematic determination of the effects of various sensor parameters and environmental variables on the capability to identify target materials. The approach incorporated an experimental program of data collection and laboratory target signature measurements together with the development of a unique data analysis scheme. Targets were illuminated with a Krypton laser that produced visible light simultaneously in four spectral channels (0.65 micrometers, 0.57 micrometers, 0.52 micrometers, and 0.48 micrometers). The 1.5-watt beam, having a divergence of 1.6 mrad, was scanned horizontally across an existing test range. The primary target was a calibrated series of painted panels of various sizes, colors, and orientations. Parameters studied included gain, bandwidth, scan speed, field of view, color contrast, and surface moisture. Atmospheric transmission and background illumination were measured. (Modified author abstract)

AD-786 039/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
CALCULATION OF THE EFFECTIVE RANGE OF NIGHT VISION DEVICES.
S. A. Sukhoparov. Nov 73, 7p Rept no. FSTC-HT-23-1114-73
Trans. of Priborostroenie (USSR) n6 p102-105 1972.

Descriptors: *Night vision devices, Translations, Range(Distance), Differential equations, Integral equations, Contrast, Images, USSR.

A method is proposed for calculating the effective range of night vision devices. A formula is derived which can be used to calculate the effective range of night vision devices from the known structural

parameters of the device and the characteristics of the illuminating device which takes into account the spectral transmission of the atmosphere, the effect of the resulting power of the instrument together with the eye and the contrast in the image.

PAT-APPL-492 093 PC$3.25/MF$2.25
Department of the Air Force Washington D C
A TRIANGULAR INTERFEROMETRIC LIGHT-SOURCE TRACKER.
Patent application,
Dennis Kelsall. Filed 26 Jul 74, 12p Rept no.
Governmental-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Optical tracking, *Interferometers, Patents, Interferometry, Signal processing, Beam splitting.
Identifiers: PAT-CL-356-106-R, Patent applications.

A system is described in the patent application for tracking the position of a light source by mounting two orthogonal triangular interferometric systems on a gimbaled platform. The interferometric systems each provide a carrier frequency signal depending upon their pointing angle with respect to the light source. These carrier signal frequencies provide the error signals for the X and Y axis drives of the platform.

17I. Radar Detection

AD-785 729/5GA PC$3.75/MF$2.25
Hughes Aircraft Co Fullerton Calif Ground Systems Group
ACOUSTIC VELOCITY CORRELATOR.
Semi-annual rept. 1 Sep 73-28 Feb 74,
R. C. Knittle, and T. W. Bristol. Sep 74, 30p Rept no. FR-74-14-626 ECOM-0121-3-72
Contract DAAB07-72-C-0121
See also AD-782 232.

Descriptors: *Correlators, *Signal processing, Acoustic velocity, Surface waves, Acoustic waves, Doppler systems, Broadband.

The object of the program is to determine the feasibility of implementing the velocity correlator network of a Pulse Burst Processor System using acoustic surface waves. The acoustic velocity correlator is a network of multiple tapped delay lines which corrects the Doppler time shifts of the output signals from a pulse burst correlator tapped delay line and sums the corrected signals in a single Doppler velocity channel. A 20 MHz bandwidth prototype device was developed during the first phase of the program. (Modified author abstract)

AD-786 033/1GA PC$5.25/MF$2.25
Syracuse Univ Research Corp N Y
ON-LINE HIGH RESOLUTION ELECTROMAGNETIC IMAGING.
Final rept. 17 Jan 73-17 Jan 74,
Robert A. Herman, Peter H. Stockman, and Joseph W. Verzino. Aug 74, 118p Rept no. SURC-TR-74-065 RADC-TR-74-201
Contract F30602-73-C-0136

Descriptors: *Radar images, *Image processing, High resolution, Broadband, Real time, Data processing.

The objective of the study was to determine if techniques could be intergrated to form an on-line, real-time system for imaging objects. An additional objective of the investigation was to determine the hardware and software required to implement such a system to assess its overall effectiveness. A hardware/software system was devised that demonstrated the feasibility of producing images in near real-time from wideband radar data. The appropriate algorithms were developed to demonstrate the technique, and subsystem interactions are documented in flow diagrams. In addition, reduced cost/capacity systems were investigated; each of these systems is capable of producing real-time images. (Modified author abstract)

AD-786 273/3GA PC$3.75/MF$2.25
National Aeronautical Lab Bangalore (India)
TEST AND EVALUATION OF A REMOTE CONTROL AND RADIOFREQUENCY REPEATER SYSTEM FOR TELEVISED RADAR DISPLAY APPLICATIONS.
Final rept. Dec 72-Mar 74,
James G. Dong. Sep 74, 28p Rept no. FAA-NA-74-14 FAA-RD-74-140

Descriptors: *Display systems, Radar equipment, Television systems, Remote control, Radio repeaters, Microwave equipment, Modems.

Evaluation was accomplished on engineering models of a remote control system (RCS) for a BRITE-2 televised display and a radiofrequency (RF) repeater operating at 14.87 and 15.07 GHz. Major portions of the laboratory tests were achieved during the factory acceptance tests. Testing at the National Aviation Facilities Experimental Center was directed toward establishing a system configuration appropriate for a satellite airport. The RCS operational capability utilizing a C1-conditioned voice-grade line was assured. The RF repeater was compatible with an existing microwave link which permitted experiments with mixed radar video and alphanumeric data inputs into the RF system. With the addition of the new equipments, system versatility was increased. (Author)

AD-915 411/3GA PC$3.75/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
SURVEILLANCE, NAVIGATION, AND COLLISION AVOIDANCE RADAR FOR HIGH-SPEED SHIPS AND CRAFT.
Technical document Oct 71-Aug 73,
P. J. Stahnke, and J. C. Stewart. Oct 73, 35p
NELC-TD-277
Distribution Limitation now Removed.

Descriptors: *Radar, Ships, *Navigation, Ocean surveillance, Surveillance, Surface effect ships, Hydrofoil craft, Air cushion vehicles, Phased arrays, Circular antennas, Electronic scanners, Antenna arrays, Planning, Mission profiles, Radar antennas, Display systems.
Identifiers: Collision avoidance.

The requirements for surveillance, navigation, and collision avoidance by hydrofoils, air-cushion vehicles, and surface-effects ships in the 1980s are analyzed. The radar systems to perform these functions which are presently installed or planned for installation are assessed and problem areas identified. Design and development approaches for new equipments are suggested, including a 'dual' antenna configuration using a single processing system and two antennas (one with a 360-degree aspect, the other with a selectable sector scan capability) and a 'single' antenna configuration using either a circular-array electronic scan antenna or a phased-array antenna.

17J. Seismic Detection

AD-786 017/4GA PC$3.75/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
SEISMIC WAVES FROM UNDERGROUND EXPLOSIONS OF CONCENTRATED CHARGES.
B. G. Rulev. 21 Aug 74, 26p Rept no. FTD-MT-24-1604-74
Edited machine trans. of Akademiya Nauk SSSR. Institut Fiziki Zemli. Trudy, n14 p179-192 1971, by Marilyn Olaechea.

Descriptors: *Seismic detection, *Underground explosions, *Seismic waves, Earthquakes, Explosive charges, Seismic data, Intensity, Seismic reflection, Surface waves, Seismic detection, Seismographs, Translations, USSR.

The report studies the seismic waves which are emitted directly from the explosion center: High-frequency longitudinal wave P, long-period longitudinal wave P sub L, and surface wave R. A concentrated charge of chemical explosives is always used to excite these waves. The parameters of the waves P, P sub L, and R from this type of simple charge are, aside from being significant in themselves, necessary for calculating more complex charges (dispersed, short-delay, etc.). For example, it is shown that soil vibrations from linearly dispersed charges represent a superimposition of the vibrations from the passing of waves of individual concentrated charges. In the last section of the present work it is apparent that the parameters of direct waves of direct waves are also needed for calculating the intensity of reflected waves.

AD-786 058/8GA Reprint
Frank J Seiler Research Lab United States Air Force Academy Colo
DEVELOPMENT AND CALIBRATION OF A PORTABLE SEISMIC MONITOR,
Bill J. Simmons. 1974, 12p Rept no. SRL-TR-74-0018
Availability: Pub. in AIAA Mechanics and Control of Flight Conference Held in Anaheim, Calif. on August 5-9, 1974. p1-8, AIAA Paper No. 74-87-1.

Descriptors: *Seismometers, Test methods, Calibration, Portable equipment, Handbooks, Motion, Detectors, Inertial systems, Response.
Identifiers: Design.

Geokinetic disturbances, which severely impact modern inertial instrument tests, often require measurement under field conditions; e.g., proposed test site surveys and source isolation of troublesome cultural motion. A low-cost, Portable Seismic Monitor (PSM) has been developed to measure both linear and angular motion disturbance. With geophones as sensors, an electronics carrying-case package was designed which includes four channels of high gain amplifier compensation networks, a power supply, an indicator, and auxiliary output provisions. Geophone response basics, compensation technique, and calibration response determination methods and PSM hardware details are discussed. (Author)

AD-786 238/6GA PC$5.75/MF$2.25
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
ADVANCED MARINE TECHNOLOGY: BENTHIC ARRAY.
Final rept. 15 Sep 69-15 Dec 71,
William A. Prothero, Jr., and Walter H. Munk. Jul 74, 129p Rept nos. AOEL-65, SIO-Ref-74-24
Contract N00014-69-A-0200-6012, ARPA Order-1348
See also AD-283 189

Descriptors: *Seismic detection, *Seismic arrays, *Ocean bottom, *Seismic detection, Microseisms, Earthquakes, Construction, Test methods, Quartz, Flowmeters, Tiltmeters, Accelerometers, Background noise, Earth crust, Tides, Anomalies, Ground motion.
Identifiers: Seismic noise, Design, Seismic discrimination.

An ocean bottom seismic recording capsule has been designed, constructed, and tested. It contains a Block-Moore quartz torsion fiber accelerometer, a two-axis tilt-meter, a current speed meter, a thermometer, and digital recording and control electronics. The sensors and recording electronics are contained in three 22 inch I.D. pressure spheres made from Alcoa aluminum hemispheres. The capsule rests on the ocean floor without lines to the surface. Upon acoustic command, an explosive cable cutter separates the positively buoyant instrument capsule from a support tripod and battery frame. The capsule then floats to the surface for recovery. The acoustic system has both command and diagnostic capabilities. Digital diagnostic data is transmitted to the surface at 100 bps.

Microseisms and earthquakes have been recorded. (Modified author abstract)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

AEC-tr-7563 PC$7.25/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
REPORT OF THE TECHNICAL SUBCOMMITTEE NUCLEAR FUSION RESEARCH AND DEVELOPMENT CONFERENCE.
11 Nov 73, 81p
Translation of Japanese report.

Descriptors: (*Thermonuclear reactors, *Planning), Jft-2 tokamak, Management, Plasma, Research programs.

For abstract, see NSA 30 08, number 20878.

COO-2007-38 PC$4.25/MF$2.25
Illinois Univ., Urbana.
ADVANCED METHODS FOR NUCLEAR REACTOR-GAS LASER COUPLING. TECHNICAL PROGRESS REPORT, JANUARY 1–AUGUST 31, 1973.
G. H. Miley, and J. T. Verdeyen. 1973, 22p
Contract AT(11-1)-2007

Descriptors: (*Lasers, *Research programs), (*Thermonuclear reactors, Lasers), Alpha particles, Carbon dioxide lasers, Chemical reactions, Electron density, Helium, Irradiation, Neon, Spectra.

For abstract, see NSA 30 08, number 20881.

COO-2218-13 PC$4.00/MF$2.25
Illinois Univ., Urbana.
COMPRESSION-EXPANSION CYCLES FOR TOROIDAL FUSION REACTORS.
G. H. Miley. 1974, 16p CONF-740402-17
Contract AT(11-1)-2218

Descriptors: (*Thermonuclear reactors, *Energy losses), Compression, Efficiency, Energy conversion, Expansion, Low-beta plasma, Toroidal configuration.

For abstract, see NSA 30 08, number 20882.

COO-2218-18 PC$8.25/MF$2.25
Illinois Univ., Urbana.
ADVANCED ENERGY CONVERSION FOR FUSION REACTORS WITH A SUBTASK ON CHARGE-EXCHANGE EFFECTS DURING NEUTRAL BEAM INJECTION. TECHNICAL PROGRESS REPORT, AUGUST 31, 1973–SEPTEMBER 1, 1974.
G. H. Miley. 1974, 103p
Contract AT(11-1)-2218

Descriptors: (*Thermonuclear reactors, *Neutral atom beam injection), Charge exchange, Deuterium, Energy balance, Energy conversion, Fuels, Research programs, Tritium.

For abstract, see NSA 30 08, number 20883.

EUR-CEA-FC-725 PC$4.50/MF$2.25
Association Euratom-CEA, Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Groupe de Recherches sur la Fusion Controlee; CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Physique du Plasma et de la Fusion Controlee.
ENERGY STORABLE IN SUPERCONDUCTING RESONANT CAVITIES.
J. Reuss. Jan 74, 26p
In French. U.S. Sales Only.

Descriptors: (*Cavity resonators, *Stored energy), (*Thermonuclear devices, Stored energy), Performance, Plasma, Superconductors.

For abstract, see NSA 30 08, number 20884.

IPP-4/114 PC$6.50/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
HIGH-VOLTAGE PULSE GENERATOR.
G. Klement, and H. Wedler. Mar 74, 67p
In German. U.S. Sales Only.

Descriptors: (*Pulse generators, *Design), (*Thermonuclear devices, Pulse generators), Capacitors, Power supplies, Spark gaps.

For abstract, see NSA 30 08, number 20885.

LA-5604-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
ABLATION STABILITY OF LASER-DRIVEN IMPLOSIONS.
D. B. Henderson, R. L. McCrory, and R. L. Morse. Jun 74, 5p
Contract W-7405-eng-36

Descriptors: (*Thermonuclear reactions, *Laser radiation), (*Laser-radiation heating, *Stability), Ablation, Compression, Implosions.

For abstract, see NSA 30 08, number 20889.

LA-5635-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
SURVEY OF A 210-KJ DENSE PLASMA FOCUS (DPF 6).
D. A. Freiwald, and J. N. Downing. Jun 74, 13p
Contract W-7405-eng-36

Descriptors: (*Plasma focus devices, *Reviews), Electric currents, Electric potential, Electric probes, X radiation.

For abstract, see NSA 30 08, number 20890.

LA-5640-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
CTR BREAKEVEN INCLUDING ENERGY TRANSFER AND RECOVERY EFFICIENCIES.
D. A. Freiwald, and R. A. Gerwin. Jun 74, 7p
Contract W-7405-eng-36

Descriptors: (*Thermonuclear reactions, *Energy balance), (*Thermonuclear reactors, Energy balance), Efficiency, Energy, Equations, Recovery.

For abstract, see NSA 30 08, number 20891.

LA-5641-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
APPROXIMATE SPHERICAL BLAST THEORY AND LASER-INITIATED PELLET MICROEXPLOSIONS.
D. A. Freiwald. Jun 74, 5p
Contract W-7405-eng-36

Descriptors: (*Thermonuclear reactions, Laser radiation), (*Laser radiation, *Interactions), Explosions, Shock waves, Spherical configuration.

For abstract, see NSA 30 08, number 20892.

NP-20040 PC$10.60/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
A SHORT COURSE IN FUSION POWER.
1972, 372p

Descriptors: (*Plasma, *Lectures), (*Thermonuclear reactors, Lectures), Breeding blankets, Design, Divertors, Economics, Planning, Site selection, Thermonuclear reactor walls.

For abstract, see NSA 30 08, number 20893.

ORNL-TM-4575 PC$6.25/MF$2.25
Oak Ridge National Lab., Tenn.
FUSION CHAIN REACTOR PROSPECTS AND PROBLEMS.
J. R. Jr. McNally. Jul 74, 64p
Contract W-7405-eng-26

Descriptors: (*Thermonuclear reactors, *Chain reactions), (*Magnetic mirrors, Chain reactions), (*Fusion reactions, Chain reactions), Alpha particles, Ion beams, Layers, Lithium 6.

For abstract, see NSA 30 08, number 20894.

ORNL-TM-4647 PC$4.25/MF$2.25
Oak Ridge National Lab., Tenn.
REACTIVITY OF ADVANCED FUSION FUELS.
J. R. Jr. McNally. Jul 74, 25p
Contract W-7405-eng-26

Descriptors: (*Magnetic mirrors, *Chain reactions), (*Thermonuclear reactions, Chain reactions), Deuterium, Fusion reactions, High-beta plasma, Lithium 6.

For abstract, see NSA 30 08, number 20895.

UCID-16564 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
RELATION OF THE MIRROR CONCEPT TO OTHER MAGNETIC APPROACHES TO FUSION POWER.
T. K. Fowler. 25 Jul 74, 14p
Contract W-7405-Eng-48

Descriptors: (*Magnetic mirrors, *Comparative evaluations), (*Toroidal theta pinch devices, Comparative evaluations), (*Tokamak devices, Comparative evaluations), Beta ratio, Confinement, Neutral atom beam injection, Plasma heating.

For abstract, see NSA 30 08, number 20896.

UCRL-51606 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
CALCULATED INTENSITY THRESHOLD FOR THE MAINTENANCE OF LASER-SUPPORTED DETONATION WAVES WITH VARIOUS ELECTRON DENSITIES.
N. M. Ferriter, and A. M. Winslow. 10 Jun 74, 15p
Contract W-7405-eng-48

Descriptors: (*Laser radiation, *Interactions), (*Shock waves, *Wave propagation), Absorption, Air, Argon, Electron density, One-dimensional calculations.

For abstract, see NSA 30 08, number 20897.

UCRL-51608 PC$9.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
ELECTRON BEAM–DEUTERATED TARGET EXPERIMENT.
B. L. Jr. Freeman. 14 Jun 74, 125p
Contract W-7405-Eng-48

Descriptors: (*Plasma production, *Electron beams), Deuterium, Interactions, Polyethylenes, Targets, Thermonuclear reactions.

For abstract, see NSA 30 08, number 20898.

UCRL-51610 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
MODULAR FISSION–FUSION HYBRID BLANKET.
L. D. Hansborough, and R. W. Werner. 1 Jul 74, 15p
Contract W-7405-eng-48

Descriptors: (*Breeding blankets, *Fission), Cooling, Design, Helium, Lithium, Magnetic mirrors, Niobium, Stainless steels, Thermonuclear reactors, Tritium.

For abstract, see NSA 30 08, number 20899.

UCRL-74487 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
FUTURE INTERNAL COMBUSTION ENGINE.
E. Teller. 9 May 72, 10p CONF-720558-3

Descriptors: (*Thermonuclear reactions, *Space flight), Deuterium, Explosions, Laser radiation, Laser-radiation heating, Propulsion, Tritium.

For abstract, see NSA 30 08, number 20900.

UCRL-74488 PC$4.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
PROSPECTS FOR UNCONVENTIONAL APPROACHES TO CONTROLLED FUSION.
L. Wood, and J. Nuckolls. 29 Dec 71, 24p CONF-711203-3

Descriptors: (*Thermonuclear reactors, *Planning), Computer calculations, Cost, Electron beams, Laser-radiation heating, Microwave radiation, Plasma simulation, Reviews.

For abstract, see NSA 30 08, number 20901.

UCRL-74938 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
EXOTIC CTR FUELS: NON-THERMAL EFFECTS AND LASER FUSION APPLICATIONS.
T. Weaver, G. Zimmerman, and L. Wood. 30 Oct 73, 13p CONF-731009-10

Descriptors: (*Thermonuclear reactors, *Fuels), Beryllium 9, Boron 10, Boron 11, Deuteron beams, Lithium 6, Nitrogen 15, Proton beams.

For abstract, see NSA 30 08, number 20902.

WASH-1295 PC$8.75/MF$2.25
USAEC, Washington, D.C.
STATUS AND OBJECTIVES OF TOKAMAK SYSTEMS FOR FUSION RESEARCH.
1974, 111p

Descriptors: (*Tokamak devices, *Planning), Boundary conditions, Impurities, Plasma heating, Research programs, Scaling laws.

For abstract, see NSA 30 08, number 20903.

18B. Isotopes

AECL-4667 PC$4.75/MF$2.25
Atomic Energy of Canada Ltd., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
CHARACTERIZATION OF SUPPORTED METAL CATALYSTS BY GAS CHEMISORPTION IN A CONTINUOUS FLOW SYSTEM.
A. G. Wikjord, and W. P. Munson. Mar 74, 31p CONF-730661-2
U.S. Sales Only.

Descriptors: (*Heavy water, *Production), (*Chemisorption, *Measuring instruments), Catalysts, Isotopic exchange, Palladium, Platinum.

For abstract, see NSA 30 08, number 21304.

AERE-R-6758 PC$4.50/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
TECHNIQUES FOR THE PRODUCTION OF HEAVY ION BEAMS.
J. H. Freeman, G. A. Gard, and W. Temple. Mar 71, 29p
U.S. Sales Only.

Descriptors: (*Isotope separation, Ion sources), (*Ion sources, *Design), Heavy ions, High temperature, Operation.

For abstract, see NSA 30 08, number 21305.

AI-65-144 PC$24.50/MF$2.25
Atomics International Div., Canoga Park, Calif.
LARGE RADIOISOTOPE HEAT SOURCE STUDY, MID-TERM REPORT TO NEW YORK OPERATIONS OFFICE OF THE ATOMIC ENERGY COMMISSION.
20 Aug 65, 429p
Contract AT(04-4)-22

Descriptors: (*Radioisotope heat sources, *Research programs), (*Plutonium 238, Radioisotope heat sources), (*Curium 244, Radioisotope heat sources), (*Polonium 210, Radioisotope heat sources), Brayton cycle, Power supplies, Rankine cycle, Space vehicles, Thermoelectric generators.

For abstract, see NSA 30 08, number 21329.

JAERI-M-5568 PC$6.00/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
LARGE EXP 60 CO SOURCES TEST PRODUCTION WITH JRR-3.
K. Tachikawa, H. Kato, T. Genka, and T. Ito. Feb 74, 58p
In Japanese. U.S. Sales Only.

Descriptors: (*Cobalt 60, *Isotope production), Decontamination, Gamma sources, Hot cells, Irradiation, Jrr-3 reactor, Nuclear materials management, Radioactive waste disposal, Radioactivity, Remote handling, Targets.

For abstract, see NSA 30 08, number 20821.

LA-5630-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
LASER-ENHANCED CHEMICAL REACTIONS AND THE LIQUID STATE: AN INTRODUCTION.
C. K. Rofer-DePoorter, and G. L. DePoorter. Jun 74, 18p
Contract W-7405-eng-36

Descriptors: (*Laser isotope separation, *Chemical reactions), Economics, Energy transfer, Gases, Industry, Laser radiation, Liquids, Synthesis.

For abstract, see NSA 30 08, number 21306.

PATENT-3 792 156 Not available NTIS
Atomic Energy Commission, Washington, D.C.
DUAL PRESSURE-DUAL TEMPERATURE ISOTOPE EXCHANGE PROCESS.
Patent,
Dale F. Babcock. Filed 21 Jun 72, patented 12 Feb 74, 6p PAT-APPL-265 059
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Isotope exchange, *Patents, *Heavy water.
Identifiers: PAT-CL-423-580.

This invention relates to an improvement in the dual-temperature isotope exchange process for concentrating an isotope of an element by its exchange between two substances at two temperatures. This process has been of major importance in the manufacture of heavy water.

PATENT-3 794 470 Not available NTIS
Atomic Energy Commission, Washington, D.C.
CONTINUOUS PLUTONIUM DISSOLUTION APPARATUS.
Patent,
Frank G. Meyer, and Charles N. Tesitor. Filed 6 Jun 72, patented 26 Feb 74, 4p PAT-APPL-260 155
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Chemical reactors, *Plutonium isotopes, *Dissolving, *Patents, Isotope separation, Acidolysis, Purification.
Identifiers: PAT-CL-23-272-6-S.

This invention is concerned with continuous dissolution of metals such as plutonium. A high normality acid mixture is fed into a boiler vessel, vaporized and subsequently condensed as a low normality acid mixture. It is then conveyed to a dissolution vessel and contacted with the plutonium metal so as to dissolve the same in the dissolution vessel, reacting therewith forming plutonium nitrate. The reaction products are then conveyed to the mixing vessel and maintained soluble by the high normality acid, with separation and removal of the desired constituent.

UCLA-34-P-134-10 PC$4.00/MF$2.25
California Univ., Los Angeles.
BIOLOGICAL CYCLING OF ELEMENTS AND STABLE ISOTOPES IN MARINE ENVIRONMENTS. PROGRESS REPORT, MAY 1, 1973–MAY 1, 1974.
I. R. Kaplan. 1974, 18p
Contract AT(04-3)-34

Descriptors: (*Uranium, *Natural occurrence), (*Uranium 234, *Isotope ratio), (*Uranium 238, Isotope ratio), Abundance, Carbon, Carbon compounds, Drill cores, Humic acids, Pacific ocean, Sediments, Variations.

For abstract, see NSA 30 08, number 21046.

UCRL-75545(Rev.1) PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
ISOTOPE SEPARATION BY LASER RADIATION PRESSURE DEFLECTION OF AN ATOMIC BEAM.
A. F. Bernhardt, D. Duerre, J. Simpson, L. L. Wood, and J. Goldsborough. 7 Jun 74, 8p CONF-740617-7

Descriptors: (*Barium isotopes, *Isotope separation), (*Laser isotope separation, *Performance).

For abstract, see NSA 30 08, number 21307.

18C. Nuclear Explosions

LA-5615-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
DESIGN CONSIDERATIONS FOR A HIGH-PRESSURE, EQUATION-OF-STATE EXPERIMENT.
C. E. III Ragan. May 74, 18p
Contract W-7405-eng-36

Descriptors: (*Nuclear explosions, *Neutron transport), (*Shock waves, *Wave propagation), Equations of state, Fission, Ground motion, Molybdenum, Neutron flux, Nevada test site, Numerical solution, Underground explosions.

For abstract, see NSA 30 08, number 21029.

PNE-MHF-1 PC$8.00/MF$2.25
CER Geonuclear Corp., Las Vegas, Nev.
RIO BLANCO MASSIVE HYDRAULIC FRACTURE. PROJECT DEFINITION.
1973, 99p

Descriptors: (*Natural gas, *Production), (*Sandstones, *Fracturing), Colorado, Cost, Efficiency, Environment, Geologic deposits, Rio blanco event, Rulison event, Safety.

For abstract, see NSA 30 08, number 21030.

UCID-16161 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
CHIMNEY PERMEABILITY BY ATMOSPHERIC PRESSURE CHANGE: PRELIMINARY PERMEABILITY CALCULATIONS.
D. Snoeberger, G. Morris, and R. Rozsa. 29 Nov 72, 16p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Cavities), (*Cavities, *Permeability), Contained explosions, Darcy law.

For abstract, see NSA 30 08, number 21032.

UCID-16529 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
N-COMPONENT EXPLOSIVE SYSTEMS: FEASIBILITY STUDY.
R. Quong. 11 Jul 74, 15p
Contract W-7405-eng-48

Descriptors: (*Nuclear weapons, *Detonators), (*Chemical explosions, *Performance testing).

For abstract, see NSA 30 08, number 21033.

UCRL-51560 PC$5.45/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
RIO BLANCO: NUCLEAR OPERATIONS AND CHIMNEY REENTRY.
W. R. Woodruff, and R. S. Guido. 15 May 74, 99p
Contract W-7405-eng-48

Descriptors: (*Natural gas, *Production), (*Rio blanco event, *Planning), Cavities, Control equipment, Nuclear explosives, Performance testing.

For abstract, see NSA 30 08, number 21035.

USGS-474-180 PC$4.25/MF$2.25
Geological Survey, Denver, Colo.
ASYMMETRY OF COLLAPSE SINKS IN YUCCA FLAT, NEVADA TEST SITE, NEVADA.
W. L. Ellis, and R. P. Snyder. Jun 74, 22p NTS-243
Contract AT(29-1)-474

Descriptors: (*Nuclear explosions, Nevada test site), (*Nevada test site, Earth crust), (*Earth crust, *Deformation), Cavities, Configuration, Underground explosions.

For abstract, see NSA 30 08, number 21038.

18D. Nuclear Instrumentation

AERE-R-7250 PC$4.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
ROTATING DRUM CLOTHING MONITOR FOR THE DETECTION OF RADIOACTIVE NUCLIDES INCLUDING EXP 239 PU.
D. C. Stevens, and W. L. Churchill. May 74, 14p
U.S. Sales Only.

Descriptors: (*Protective clothing, *Radiation monitoring), (*Plutonium 239, Radiation monitoring), (*Solid scintillation detectors, *Performance), Contamination, Sensitivity, Surface contamination.

For abstract, see NSA 30 08, number 21186.

BARC-752 PC$4.00/MF$2.25
Bhabha Atomic Research Centre, Bombay (India). Radiochemistry Div.
NEUTRON FLUX MAPPING AT APSARA REACTOR USING SOLID STATE TRACK DETECTORS.
D. S. Srivastava, R. Sampathkumar, N. K. Chaudhuri, and R. H. Iyer. 1974, 20p
U.S. Sales Only.

Descriptors: (*Neutron flux, *Dielectric track detectors), (*Apsara reactor, Neutron flux), Fission foil detectors, Fission tracks, Neutron detection.

For abstract, see NSA 30 08, number 21187.

CEA-R-4580 PC$4.75/MF$2.25
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
CALIBRATION OF A LARGE AREA PROPORTIONAL COUNTER FOR EXP 239 PU X-RAY DETECTION IN LUNGS.
M. L. Daburon, and L. Jeanmaire. Jul 74, 34p
In French. U.S. Sales Only.

Descriptors: (*Plutonium 239, *Tissue distribution), (*Lungs, *Radionuclide kinetics), (*Proportional counters, *Calibration), Man, Measuring methods, Phantoms, Radioisotope scanning, Uptake, X-ray detection.

For abstract, see NSA 30 08, number 21188.

COM-74-50853/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ELECTRON BEAM CURRENT MONITORING SYSTEM.
Final rept.,
J. S. Pruitt. 1971, 13p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in Nuclear Instruments and Methods, v92 p285-297 1971.

Descriptors: *Electron beams, Monitors, Faraday effect.

The beam current monitoring system used with the NBS electron linac is described in detail. The system consists of a water-cooled Faraday cup designed to dissipate the energy in a 1 cm diameter, 100 kW beam of 100 MeV electrons, and a non-intercepting ferrite loaded toroidal coil. The ferrite is used for continuous-duty monitoring and can be calibrated in absolute units with the Faraday cup. The Faraday cup errors have been measured with an absolute accuracy of less than 0.1% by bucking the Faraday cup current against the beam current, using the ferrite monitor as a null detector. The Faraday cup losses are about 0.5% at 30 MeV and decrease to less than 0.1% at 120 MeV. These losses are attributed to backscatter of high energy electrons from the front face of the cup.

COM-74-50854/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CORRECTION TO ELECTRON BEAM MONITOR PAPERS.
Final rept.,
J. S. Pruitt. 1973, 3p
Pub. in Nuclear Instruments and Methods, v109 p393-395 1973.

Descriptors: *Electron beams, Monitors, Faraday effect.

Two mistakes have been found in previously published papers about the electron beam monitor system of the NBS Linac. They invalidate the previously proposed explanation of the change in the measured Faraday cup error when vacuum foils are introduced into the beam line. When these mistakes are corrected, it is found that the generation of secondary electron by Moller scatter in the vacuum foils accounts for only about one third of the observed change, rather than all of it, as originally claimed. Additional experiments at 50 MeV have shown that the observed change is a non-linear function of foil thickness, and that the beam transmitted by the foils includes electrons with energies as small as 0.3 MeV. Electrons with this low an energy could not have been generated by Moller scattering and must be the product of multiple processes in the foils.

FRNC-TH-474 PC$7.25/MF$2.25
Toulouse-3 Univ., 31 (France).
STUDY AND DEVELOPMENT OF TWO IONIZATION CHAMBERS FOR THE DOSIMETRY OF SMALL EXP 252 CF SOURCES.
A. Biau. 1973, 82p
In French. U.S. Sales Only.

Descriptors: (*Ionization chambers, *Performance), (*Californium 252, Radiation source implants), (*Radiation source implants, *Radiation doses), (*Gamma dosimetry, Ionization chambers), Computer calculations, Design, Dose rates, Geometry, Neutron dosimetry, Operation, Phantoms, Point sources, Radiotherapy, Spatial distribution.

For abstract, see NSA 30 08, number 21217.

HASL-285 PC$4.00/MF$2.25
USAEC Health and Safety Lab., New York.
CASO SUB 4 :DY TLD FOR LOW LEVEL PERSONNEL MONITORING.
A. Shambon. Jun 74, 15p

Descriptors: (*Thermoluminescent dosemeters, *Performance), Calcium sulfates, Calibration, Dysprosium additions, Energy dependence, Fabrication, Powders, Sensitivity.

For abstract, see NSA 30 08, number 21218.

IEA-322 PC$4.00/MF$2.25
Instituto de Energia Atomica, Sao Paulo (Brazil).
PREPARATION OF THERMOLUMINESCENT CALCIUM SULFATE ACTIVATED WITH THULIUM DISPERSIONS.
M. Guenin, and M. M. P. Campana. Jan 74, 8p
In Portuguese. U.S. Sales Only.

Descriptors: (*Thermoluminescent dosemeters, *Chemical preparation), Calcium sulfates, Performance, Sensitivity, Thulium additions.

For abstract, see NSA 30 08, number 21219.

LA-5648-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
AN IDENTIFYING, MOMENTUM-SENSITIVE DETECTOR SYSTEM FOR NEGATIVE PIONS.
H. O. Meyer, and K. Springer. Jul 74, 4p
Contract W-7405-eng-36

Descriptors: (*Pion detection, Solid scintillation detectors), (*Solid scintillation detectors, *Particle identification), Operation, Performance, Pions minus.

For abstract, see NSA 30 08, number 21248.

NRPB-R-18 PC$5.50/MF$2.25
National Radiological Protection Board, Harwell (UK).
MEASUREMENT OF ACTIVITY OF SURFACES CONTAMINATED BY ELECTRON-CAPTURE NUCLIDES.
W. J. Iles, and D. F. White. Apr 74, 47p
U.S. Sales Only.

Descriptors: (*Surface contamination monitors, *Comparative evaluations), Cadmium 109, Chromium 51, Cobalt 57, Electron capture decay, Electron capture radioisotopes, Geiger-mueller counters, Iodine 125, Iron 55, Performance, Proportional counters, Radioactivity, Scintillation counters, Surface contamination.

For abstract, see NSA 30 08, number 21205.

PATENT-3 786 270 Not available NTIS
Atomic Energy Commission, Washington, D.C.
PROPORTIONAL COUNTER RADIATION CAMERA.
Patent,
Casimer J. Borkowski, and Manfred K. Kopp.
Filed 1 Feb 73, patented 15 Jan 74, 12p PAT-APPL-328 579
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Proportional counters, *Patents, *Cameras, Radiation counters.
Identifiers: PAT-CL-250-385.

The patent describes a gas-filled proportional counter camera that images a photon emitting source. A two-dimensional, position-sensitive proportional multiwire counter is provided as the detector. The counter consists of a high voltage anode screen sandwiched between orthogonally disposed planar arrays of multiple parallel strung, resistively coupled cathode wires.

PATENT-3 787 746 Not available NTIS
Atomic Energy Commission, Washington, D.C.
QUENCHING GAS FOR DETECTORS OF CHARGED PARTICLES.
Patent,
Muzaffer Atac. Filed 11 May 73, patented 22 Jan 74, 6p PAT-APPL-359 396
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Charged particles, *Radiation measuring instruments, Gases, Quenching media.
Identifiers: PAT-CL-313-93.

In the patent operation of detectors of charged particles such as wire counters and Geiger-Muller tubes is improved by filling the counters with a quenching-gas mixture of argon, isobutane and methylchloroform.

PATENT-3 789 227 Not available NTIS
Atomic Energy Commission, Washington, D.C.
ENVIRONMENTAL DOSIMETER OF THE THERMO-LUMINESCENT TYPE.
Patent,
Fred N. Eichner, and Leo F. Kocher. Filed 18 May 73, patented 29 Jan 74, 7p PAT-APPL-361 757
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Dosimeters, *Patents, Luminescent dosimeters.
Identifiers: *Thermoluminescent dosimeters, PAT-CL-250-484.

This invention related to environmental dosimeters that can be placed at various locations around a nuclear facility to estimate the radiation dose that would be sustained by an individual occupying that location. More particularly, the invention relates to dosimeters that employ thermoluminescent phosphors in measuring low-level radiation dose.

RISO-M-1724 PC$4.00/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
PORTABLE CONTINUOUS SAMPLING INSTRUMENT FOR AIRBORNE BETA/GAMMA CONTAMINATION, INCORPORATING AN AUTOMATIC WARNING ALARM.
L. Boetter-Jensen, S. Griffin, and P. R. Soerensen. Apr 74, 9p
U.S. Sales Only.

Descriptors: (*Air samplers, *Operation), Aerosol monitoring, Air filters, Alarm systems, Beta detection, Contamination, Gamma detection, Performance, Radioactive aerosols.

For abstract, see NSA 30 08, number 21206.

RT/EL-(73)5 PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
NOISE REDUCTION IN CHARGE PREAMPLIFIERS BY ELIMINATION OF SHUNT FEEDBACK RESISTOR.
A. Barlocci, and D. Coiante. 27 Nov 73, 20p

Descriptors: (*X-ray spectrometers, Preamplifiers), (*Semiconductor detectors, Preamplifiers), (*Preamplifiers, *Electronic circuits), Design, Feedback, Noise, Performance.

For abstract, see NSA 30 08, number 21239.

SSI-1973-022 PC$5.00/MF$2.25
Statens Straalskyddsinstitut, Stockholm (Sweden).
TESTING OF ISOTOPE CALIBRATION INSTRUMENTS.
I. Lundehn. Oct 73, 39p
In Swedish. U.S. Sales Only.

Descriptors: (*Radioisotopes, *Calibration), (*Radiation detectors, *Performance testing), Accuracy, Corrections, Kev range 10-100, Kev range 100-1000, Mev range 01-10, National organizations, Pressure dependence, Stability, Sweden, Temperature dependence.

For abstract, see NSA 30 08, number 21207.

18E. Nuclear Power Plants

AECL-4441 PC$6.75/MF$2.25
Atomic Energy of Canada Ltd., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
SUMMARY REPORT ON THE DESIGN OF A PROTOTYPICAL 500 MWE CANDU-OCR POWER STATION.
Jun 74, 72p
U.S. Sales Only.

Descriptors: (*Heavy water moderated reactors, *Design), (*Organic cooled reactors, Design), Buildings, Comparative evaluations, Cost, Data, Economics, Natural uranium, Planning, Reactor components, Reactor protection systems, Reactor safety, Research programs, Specifications, Uranium carbides.

For abstract, see NSA 30 08, number 23086.

AECL-4661 PC$4.25/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
TEMPERATURE COEFFICIENTS OF REACTIVITY FOR NATURAL URANIUM FUEL AND URANIUM-PLUS-PLUTONIUM FUEL IN ORGANIC COOLANT AND HEAVY WATER MODERATOR.
R. B. Lyon. Apr 74, 25p
U.S. Sales Only.

Descriptors: (*Natural uranium, *Material buckling), (*Plutonium, Material buckling), (*Organic coolants, Material buckling), (*Heavy water moderated reactors, *Temperature coefficient), A codes, C codes, Comparative evaluations, Computer calculations, Computer codes, Configuration, Cross sections, Data, Doppler coefficient, G codes, Heavy water, Kernels, Organic cooled reactors, Polyphenyls, Reactivity, Temperature dependence.

For abstract, see NSA 30 08, number 23087.

ANL-7961 PC$5.45/MF$2.25
Argonne National Lab., Ill.
ROD AND PLATE HETEROGENEITY STUDIES IN ZPPR-2.
W. G. Davey, P. I. Amundson, P. J. Collins, R. G. Palmer, and W. P. Keeney. Mar 74, 73p
Contract W-31-109-eng-38

Descriptors: (*Lmfbr type reactors, *Heterogeneous effects), Configuration, Reactivity coefficients, Reactivity worths, Reactor cores, Zppr reactor.

For abstract, see NSA 30 08, number 23146.

CEA-N-1693 PC$8.25/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. de Physique des Reacteurs et de Mathematiques Appliquees.
DETERMINATION OF THE MULTIPLICATION FACTOR OF AN HTR LATTICE, IN THE CRITICAL ASSEMBLY MARIUS III, BY A PCTR METHOD.
B. Laponche, G. Gambier, J. C. Estiot, D. de Lapparent, and P. Garnaud. Feb 74, 101p
In French. U.S. Sales Only.

Descriptors: (*Htgr type reactors, Multiplication factors), (*Multiplication factors, *Measuring methods), A codes, Adjoint flux, Annular fuel elements, Coated fuel particles, Computer calculations, Corrections, Fission poisons, Heterogeneous effects, Marius reactor, Neutron leakage, Pile oscillation techniques, Reactivity, Reactor lattices, Uranium dioxide.

For abstract, see NSA 30 08, number 23077.

CONF-740406-21 PC$4.50/MF$2.25
Aerojet Nuclear Co., Idaho Falls, Idaho.
PROGRAM PLAN FOR DECONTAMINATION AND DECOMMISSIONING THE EBR-I COMPLEX AT NRTS.
J. C. Commander. 1974, 29p

Descriptors: (*Ebr-1 reactor, *Reactor decommissioning), Planning, Reactor dismantling.

For abstract, see NSA 30 08, number 23147.

CONF-740609-4 PC$4.00/MF$2.25
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
CLINCH RIVER BREEDER REACTOR: A COMBINED POWER AND FUEL SOURCE.
W. M. Jacobi, and Y. S. Tang. 1974, 19p

Descriptors: (*Clinch river breeder reactor, *Design), Fuel cycle, Performance, Specifications.

For abstract, see NSA 30 08, number 23100.

COO-2250-9 PC$4.00/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Nuclear Engineering.
MIT LMFBR BLANKET RESEARCH PROJECT. QUARTERLY PROGRESS REPORT, APRIL 1, 1974—JUNE 30, 1974.
M. J. Driscoll. 1974, 17p
Contract AT(11-1)-2250

Descriptors: (*Lmfbr type reactors, Breeding blankets), (*Breeding blankets, *Research programs), Breeding ratio, Burnup, Capture-to-fission ratio, Comparative evaluations, Computer calculations, Configuration, Cost, Data, Design, Economics, Epithermal neutrons, Foils, Fuel cycle, Gamma detection, Gamma dosimetry, Irradiation, Mathematical models, Mockup, Neutron reflectors, Neutron spectra, Nickel, Optimization, Performance, Planning, Self-shielding, Simulation, Stainless steels, Thorium, Uranium 238.

For abstract, see NSA 30 08, number 23101.

DOCKET-STN-50483-9 PC$9.75/MF$2.25
Union Electric Co., St. Louis, Mo.
CALLAWAY PLANT, UNITS 1 AND 2. LICENSE APPLICATION.
26 Jun 74, 134p DOCKET-STN-50486-9

Descriptors: Callaway-1 reactor, Callaway-2 reactor, Reactor licensing.

For abstract, see NSA 30 08, number 23253.

DOCKET-STN-50485-11 PC$6.00/MF$2.25
Rochester Gas and Electric Corp., N.Y.
STERLING POWER PROJECT NUCLEAR UNIT 1. LICENSE APPLICATION.
30 Apr 74, 59p

Descriptors: Design, Lake ontario, New york, Reactor licensing, Reactor sites, Sterling-1 reactor.

For abstract, see NSA 30 08, number 23254.

DOCKET-50281-213 PC$8.25/MF$2.25
Virginia Electric and Power Co., Richmond.
SURRY POWER STATION, UNIT 2. FIRST YEAR OPERATION REPORT, JUNE 26, 1974.
26 Jun 74, 101p

Descriptors: (*Surry-2 reactor, *Reactor operation), Containment, Equipment protection devices, Performance, Radioactive waste disposal, Reactor control systems, Reactor cooling systems, Reactor instrumentation.

For abstract, see NSA 30 08, number 23250.

DOCKET-50500-1 PC$21.25/MF$2.25
Toledo Edison Co., Ohio.
DAVIS–BESSE NUCLEAR POWER STATION, UNITS 2 AND 3. LICENSE APPLICATION.
7 Aug 74, 362p DOCKET-50501-1

Descriptors: Davis besse reactor, Reactor licensing.

For abstract, see NSA 30 08, number 23251.

DOCKET-50514-1 PC$5.00/MF$2.25
Portland General Electric Co., Oreg.
PEBBLE SPRINGS NUCLEAR PLANT, UNITS 1 AND 2. LICENSE APPLICATION.
2 Aug 74, 39p DOCKET-50515-1

Descriptors: Construction, Cost, Electric power, Pebble springs-1 reactor, Pebble springs-2 reactor, Reactor licensing.

For abstract, see NSA 30 08, number 23252.

EUR-5060e PC$22.50/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
SORA SCIENTIFIC-EXPERIMENTAL PROGRAMME.
1974, 388p
U.S. Sales Only.

Descriptors: (*Sora reactor, *Reactor experimental facilities), Performance, Reactor kinetics, Research programs, Specifications, Time-of-flight spectrometers.

For abstract, see NSA 30 08, number 23148.

EUR-5141 PC$5.75/MF$2.25
Commission of the European Communities, Karlsruhe (F.R. Germany). European Inst. for Transuranium Elements.
FEASIBILITY STUDY OF THE USE OF RADIOACTIVE FISSION PRODUCT CORRELATIONS FOR THE DETERMINATION OF BURNUP AND HEAVY ISOTOPES COMPOSITION OF BWR DODEWAARD FUEL.
P. Brand, A. Cricchio, and L. Koch. Jun 74, 52p
U.S. Sales Only.

Descriptors: (*Dodewaard reactor, *Fuel rods), Burnup, Cesium 134, Cesium 137, Fission products, Isotope ratio.

For abstract, see NSA 30 08, number 23062.

FRNC-TH-497 PC$12.25/MF$2.25
Aix-Marseille-1 Univ., 13 - Marseille (France).
OPTIMIZATION OF BURST SLUG LOCALIZATION PROCESSES AND THE CORRESPONDING DISCHARGING IN NUCLEAR REACTORS.
A. Chauvin. 1973, 181p
In French. U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, *Failed element detection), Burnup, Delayed neutrons, Fuel assemblies, Isotope ratio, Neutron detection, Optimization, Probability, Reactor fueling, Reactor protection systems, Ruptures, Sodium, Temperature measurement, Tracer techniques, Xenon 133, Xenon 134.

For abstract, see NSA 30 08, number 23102.

JAERI-M-5518 PC$12.00/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
TRIAL IRRADIATION IN JMTR, 1.
Feb 74, 177p
In Japanese. U.S. Sales Only.

Descriptors: (*Jmtr reactor, *Irradiation capsules), Design, In pile loops, Inspection, Irradiation, Irradiation procedures, Nuclear fuels, Physical radiation effects, Reactor materials.

For abstract, see NSA 30 08, number 23150.

JUL-1059-RG PC$6.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorentwicklung.
OTTO-PEBBLE BED REACTOR IN THORIUM FUEL CYCLE.
E. Teuchert, V. Maly, and K. A. Haas. Apr 74, 58p
In German. U.S. Sales Only.

Descriptors: (*Pebble bed reactors, *Fuel cycle), (*Thorium, Fuel cycle), Optimization, Performance, Reactor kinetics, Reactor operation.

For abstract, see NSA 30 08, number 23088.

JUL-1070-RG PC$6.75/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorentwicklung.
OTTO-PEBBLE BED REACTOR FOR A 1000 MWE HELIUM TURBINE PLANT.
E. Teuchert, G. Ballensiefen, K. A. Haas, V. Maly, and G. Mielken. May 74, 72p
In German. U.S. Sales Only.

Descriptors: (*Pebble bed reactors, *Design), (*Helium cooled reactors, Design), Cost, Direct cycle cooling systems, Gas turbines, Helium, Optimization, Performance, Reactor kinetics, Specifications.

For abstract, see NSA 30 08, number 23089.

KFK-EXT-6/73-4 PC$4.75/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Material- und Festkoerperforschung.
COMPARISON OF EXPERIMENTALLY DETERMINED CENTRAL TEMPERATURE OF BWR FUEL RODS WITH VALUES CALCULATED BY MEANS OF SATURN-L.
H. Elbel, and D. Goebel. Sep 73, 35p
In German. U.S. Sales Only.

Descriptors: (*Bwr type reactors, Fuel rods), (*Fuel rods, *Temperature distribution), Computer codes, Heat transfer, Performance, Power density, S codes.

For abstract, see NSA 30 08, number 23063.

KFKI-74-32 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
BURN-1, A COMPUTER CODE FOR CRITICAL HEAT FLUX CALCULATIONS IN TUBES AND ROD BUNDLES.
G. Gyenes, and L. Szabados. 1974, 20p
U.S. Sales Only.

Descriptors: (*Bwr type reactors, Fuel assemblies), (*Pwr type reactors, Fuel assemblies), (*Fuel assemblies, *Critical heat flux), (*Computer codes, *B codes).

For abstract, see NSA 30 08, number 23064.

RT/ING-(74)3 PC$11.25/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
VERIFICATION OF THE PEC CONTAINMENT VESSEL FOR SOME OPERATING CONDITIONS BY USE OF THE FINITE ELEMENT CODE SAFE-SHELL.B.
F. Cesari, L. Labanti, and I. Palmieri. Jan 74, 160p
In Italian. U.S. Sales Only.

Descriptors: (*Pec brasimone reactor, *Containment buildings), Computer codes, S codes, Stress analysis.

For abstract, see NSA 30 08, number 23104.

RT/ING-(74)5 PC$4.25/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
SAFETY MARGINS AGAINST BURN-OUT IN BWR'S.
V. Marinelli, and G. Testa. Feb 74, 21p CONF-731063-3
U.S. Sales Only.

Descriptors: (*Bwr type reactors, Fuel assemblies), (*Fuel assemblies, *Burnout), Critical heat flux, Reactor cores, Reactor safety, Specifications.

For abstract, see NSA 30 08, number 23065.

RT/ING-(74)8 PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
BURN-OUT CORRELATION FOR ONCE-THROUGH I.M.F.B.R. STEAM GENERATORS.
F. Campolunghi, M. Cumo, G. Ferrari, and G. Vaccaro. Feb 74, 15p
U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Steam generators), (*Steam generators, *Burnout), Configuration, Heat transfer, Temperature distribution.

For abstract, see NSA 30 08, number 23105.

UJV-3279-R PC$5.25/MF$2.25
Ustav Jaderneho Vyzkumu, Rez (Czechoslovakia).
BASIC PHYSICAL CHARACTERISTICS OF THE ACTIVE ZONE OF FAST POWER REACTORS.
I. Tinka, E. Tinkova, and I. Chermak. Apr 74, 44p
In Russian. U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, *Reactor kinetics), Criticality, Multigroup theory, Neutron diffusion equation, Neutron flux, Power density, Reactivity.

For abstract, see NSA 30 08, number 23106.

ZJE-145 PC$4.75/MF$2.25
Skoda, Plzen (Czechoslovakia).

PROGRAM OF IN-CORE MEASUREMENTS. PART 2. IRRADIATION EXPERIMENT WITH SPECIAL FUEL ASSEMBLIES.
V. Krett, J. Kott, and J. Vicek. 1974, 34p
U.S. Sales Only.

Descriptors: (*Wwr-c-prague reactor, *Experimental channels), (*Bohunice a-1 reactor, *Fuel assemblies), Heat transfer, Irradiation capsules, Neutron flux, Temperature distribution.

For abstract, see NSA 30 08, number 23155.

18F. Radiation Shielding and Protection

BNWL-SA-5026 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
IMPACT ANALYSIS OF METAL CANS DAMAGED DURING A RADIOACTIVE MATERIALS SHIPMENT.
J. M. Taylor. 17p CONF-740901-13

Descriptors: (*Radioactive materials, *Transport), (*Casks, *Impact tests), Damage.

For abstract, see NSA 30 08, number 21875.

CONF-740901-3 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
COMBINATION NEUTRON AND FIRE SHIELD.
A. R. Irvine, and L. B. Shappert. 1973, 13p

Descriptors: (*Spent fuel elements, *Transport), (*Casks, Biological shields), (*Neutrons, *Shielding materials), (*Biological shields, *Design), Fire resistance, Lithium hydroxides, Sodium hydroxides, Thermal insulation.

For abstract, see NSA 30 08, number 21876.

CONF-740901-4 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
DESIGNING PACKAGES FOR SHIPMENTS OF SOLUTIONS CONTAINING EXP 239 PU AND EXP 233 U.
W. C. Ulrich. 1974, 14p

Descriptors: (*Uranium 233, *Transport), (*Plutonium 239, Transport), (*Casks, *Design), Chemical reactions, Criticality, Gases, Hydrogen, Oxygen, Plutonium nitrates, Radiolysis, Safety, Uranyl nitrates.

For abstract, see NSA 30 08, number 21877.

CONF-740901-5 PC$4.25/MF$2.25
Oak Ridge National Lab., Tenn.
TRENDS AND PROJECTED SHIPMENTS IN THE NUCLEAR FUEL CYCLE INDUSTRY TO THE YEAR 2000.
J. O. Blomeke, J. P. Nichols, and R. Salmon. 1974, 23p

Descriptors: (*Fuel elements, *Transport), (*Spent fuel elements, Transport), (*Radioactive wastes, Transport).

For abstract, see NSA 30 08, number 21878.

CONF-740901-6 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
EXPERIMENTAL STUDY OF THE STRESS-STRAIN PROPERTIES OF CASK MATERIALS UNDER SPECIFIED IMPACT CONDITIONS.
J. H. Evans. 14p

Descriptors: (*Radioactive materials, *Transport), (*Casks, *Impact tests), (*Stainless steels, *Impact strength), (*Carbon steels, Impact strength), Strains, Stresses.

For abstract, see NSA 30 08, number 21879.

DP-MS-74-44 PC$4.25/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
THERMAL AND IMPACT TESTS RELATED TO SHIPPING CONTAINERS.
J. W. Langhaar. 1974, 23p CONF-740901-11

Descriptors: (*Plutonium 239, *Transport), (*Radioactive materials, Transport), (*Casks, *Fire resistance), Gaskets, Impact tests, Thermal testing.

For abstract, see NSA 30 08, number 21880.

KY-G-262 PC$4.00/MF$2.25
Paducah Gaseous Diffusion Plant, Ky.
QUALITY ASSURANCE IN THE "PADUCAH TIGER" PROCUREMENT.
D. H. Stitt. 24 Jun 74, 18p CONF-740901-14
Contract W-7405-eng-26

Descriptors: (*Uranium hexafluoride, *Transport), (*Casks, *Quality assurance), Enriched uranium.

For abstract, see NSA 30 08, number 21881.

KY-G-263 PC$4.25/MF$2.25
Paducah Gaseous Diffusion Plant, Ky.
RAIL SYSTEM FOR SAFE TRANSPORT OF ENRICHED URANIUM HEXAFLUORIDE IN LARGE CYLINDERS.
C. B. Clifford, A. T. Freeman, and J. R. Lawson. 1974, 22p CONF-740901-10
Contract W-7405-eng-26

Descriptors: (*Uranium hexafluoride, *Transport), (*Casks, *Impact tests), Enriched uranium, Railways.

For abstract, see NSA 30 08, number 21882.

LA-4686-MS(Suppl.) PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
SHIELDED SHIPPING CONTAINER FOR FISSILE MATERIAL CLASS 1 OR LARGE QUANTITIES OF RADIOACTIVE MATERIAL, SUPPLEMENT.
H. E. Noyes. Mar 74, 16p
Contract W-7405-eng-36

Descriptors: (*Spent fuel elements, *Transport), (*Casks, *Design), Criticality, Heat transfer, Quality assurance, Safety, Shielding, Stainless steel-304, Uranium.

For abstract, see NSA 30 08, number 21883.

LA-5589-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
SHIPPING CONTAINER FOR PLUTONIUM-238 AS FISSILE MATERIAL CLASS 1.
H. E. Noyes. May 74, 40p
Contract W-7405-eng-36

Descriptors: (*Plutonium 238, *Transport), (*Casks, *Safety), Design, Stainless steels.

For abstract, see NSA 30 08, number 21884.

NLCO-1107 PC$4.00/MF$2.25
National Lead Co. of Ohio, Cincinnati.
SAFETY ANALYSIS REPORT FOR PACKAGING STEEL BANDED WOODEN SHIPPING CONTAINERS FOR SLIGHTLY ENRICHED URANIUM METAL.
D. L. Dunaway. Jul 74, 34p
Contract AT(30-1)-1156

Descriptors: (*Slightly enriched uranium, *Transport), (*Casks, *Safety), Wood.

For abstract, see NSA 30 08, number 21885.

ORNL-TM-4648 PC$7.00/MF$2.25
Oak Ridge National Lab., Tenn.
VEHICLE CODE SYSTEM (VCS) USER'S MANUAL.
W. A. Rhoades, M. B. Emmett, G. W. Morrison, J. V. III Pace, and L. M. Petrie. Aug 74, 76p
Contract W-7405-eng-26

Descriptors: (*Shielding, Computer codes), (*Vehicles, Shielding), (*Computer codes, *V codes), D codes, Discrete ordinate method, M codes, Monte carlo method, Radiation protection, Transport.

For abstract, see NSA 30 08, number 22996.

SLA-74-5371 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
QUANTITATIVE CHARACTERIZATION OF THE ENVIRONMENT EXPERIENCED BY CARGO IN MOTOR CARRIER ACCIDENTS.
J. T. Foley, W. F. Hartman, D. W. Larson, and R. K. Clarke. 14p

Descriptors: (*Radioactive materials, *Transport), (*Vehicles, *Accidents), Environments.

For abstract, see NSA 30 08, number 21886.

SLA-74-5372 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
QUANTITATIVE CHARACTERIZATION OF THE ENVIRONMENT EXPERIENCED BY CARGO IN AIRCRAFT ACCIDENTS.
R. K. Clarke, J. T. Foley, W. F. Hartman, and D. W. Larson. 7p CONF-740901-8

Descriptors: (*Radioactive materials, *Transport), (*Aircraft, *Accidents), Environments.

For abstract, see NSA 30 08, number 21887.

SLA-74-5373 PC$4.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
QUANTITATIVE CHARACTERIZATION OF THE ENVIRONMENT EXPERIENCED BY CARGO IN RAILROAD ACCIDENTS.
D. W. Larson, R. K. Clarke, J. T. Foley, and W. F. Hartman. 22p CONF-740901-12

Descriptors: (*Radioactive materials, *Transport), (*Vehicles, *Accidents), Environments, Railways.

For abstract, see NSA 30 08, number 21888.

Y-DD-153 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
SAFETY ANALYSIS REPORT FOR PACKAGING (OAK RIDGE Y-12 PLANT MODEL DT-5 PACKAGE FOR ENRICHED URANIUM).
H. R. Dyer. Jul 74, 27p
Contract W-7405-eng-26

Descriptors: (*Enriched uranium, *Criticality), (*Casks, *Safety), Design, Destructive testing, Performance, Quality assurance, Shielding, Steels, Thermal insulation, Transport, Transport regulations.

For abstract, see NSA 30 08, number 21889.

18G. Radioactive Wastes and Fission Products

DPSPU-54-11-12 PC$4.75/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Atomic Energy Div.
HEALTH PHYSICS SITE SURVEY DATA, JANUARY TO JULY 1953.
E. L. Albenesius. 1 Apr 54, 32p

Descriptors: (*Savannah river plant, *Radiation monitoring), (*Radioactive waste disposal, Radiation monitoring), (*Fallout, Radiation monitoring),

Air filters, Alpha sources, Beta sources, Drinking water, Environment, Gaseous wastes, Liquid wastes, Plants, Radioactivity, Rivers, Sampling, Savannah river, Sediments, Stack disposal, Surface contamination, Surface waters, Uranium.

For abstract, see NSA 30 08, number 21172.

KFK-1862 PC$4.75/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany); Gesellschaft fuer Strahlen- und Umweltforschung m.b.H., Neuherberg/Muenchen (F.R. Germany).
RADIOACTIVE WASTE DISPOSAL. 1972 ANNUAL REPORT.
W. Bechthold, W. Diefenbacher, and W. Hild. 19 Dec 73, 35p GSF-T-45
U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *Salt deposits), Radioactive waste storage, Research programs, Underground disposal.

For abstract, see NSA 30 08, number 21870.

LA-5645 PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
GUIDELINES FOR THE INTERIM STORAGE OF AEC-GENERATED SOLID TRANSURANIC WASTES.
Jun 74, 70p
Contract W-7405-eng-36

Descriptors: (*Us aec, *Radioactive waste management), (*Radioactive waste storage, *Recommendations), Criticality, Fires, Fissionable materials, Materials handling, Packaging, Quality control, Radiation monitoring, Site selection, Solid wastes, Transport.

For abstract, see NSA 30 08, number 21871.

SZS-156 PC$4.25/MF$2.25
Staatliche Zentrale fuer Strahlenschutz, Berlin (German Democratic Republic).
RADIATION PROTECTION CRITERIA FOR THE EVALUATION OF GEOHYDROLOGIC CONDITIONS OF NUCLEAR PLANT SITES.
W. Koerner, J. Murglat, and M. Hannemann. Apr 74, 23p
In German. U.S. Sales Only.

Descriptors: (*Nuclear facilities, *Radioactive wastes), (*Ground water, *Contamination), (*Soils, *Radionuclide migration), Environment, Geology, Hydrology, Leaks, Liquid wastes, Radiation hazards, Radioactive waste storage, Site selection.

For abstract, see NSA 30 08, number 21178.

SZS-159 PC$4.75/MF$2.25
Staatliche Zentrale fuer Strahlenschutz, Berlin (German Democratic Republic).
SORPTION REACTION OF RADIOIODINE AND ITS SEPARATION FROM GASEOUS WASTES OF NUCLEAR PLANTS.
G. Anders, and R. Schwarzbach. May 74, 32p
In German. U.S. Sales Only.

Descriptors: (*Radioactive waste processing, *Reviews), (*Iodine, *Adsorption), (*Methyl iodide, Adsorption), (*Nuclear power plants, *Fission product release), Activated carbon, Fuel reprocessing plants, Gaseous wastes, Iodine 131, Molecular sieves.

For abstract, see NSA 30 08, number 20815.

18H. Radioactivity

KFKI-74-15 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
CALCULATION OF SPATIAL DISTRIBUTION OF IRRADIATING FLUX FROM CIRCULAR AND CYLINDRICAL SOURCES.
S. Vass. 1974, 12p
U.S. Sales Only.

Descriptors: (*Radiation sources, Radiation flux), (*Radiation flux, *Spatial distribution), Circular configuration, Cylinders, Monte carlo method, Plates.

For abstract, see NSA 30 08, number 22964.

ORO-2911-16 PC$5.25/MF$2.25
Virginia Univ., Charlottesville Research Labs. for the Engineering Sciences.
INTERACTION OF HEAVY IONS WITH MATTER. ANNUAL REPORT.
J. W. Boring, and R. E. Johnson. Jun 74, 45p ESS-3930-111-74
Contract AT(40-1)-2911

Descriptors: (*Heavy ions, *Energy losses), (*Enzymes, *Radiation effects), Inelastic scattering, Interactions, Matter, Stopping power.

For abstract, see NSA 30 08, number 22965.

PRNC-173 PC$6.75/MF$2.25
Puerto Rico Nuclear Center, Mayaguez.
TECHNIQUE FOR MEASURING GAS STOPPING POWER FOR ALPHA PARTICLES USING TWO SOLID STATE DETECTORS.
J. E. Michelen Embarek. Mar 74, 71p
U.S. Sales Only.

Descriptors: (*Alpha particles, *Range), (*Air, *Charged-particle transport), (*Oxygen, Charged-particle transport), (*Nitrogen, Charged-particle transport), Carbon dioxide, Ethane, Ethylene, Methane, Mev range 01-10, Nitrogen oxides, Propane, Propylene, Stopping power, Tetrafluoromethane, Tissues.

For abstract, see NSA 30 08, number 22966.

SZS-154 PC$4.75/MF$2.25
Staatliche Zentrale fuer Strahlenschutz, Berlin (German Democratic Republic).
GAMMA RADIATION FIELDS OF EVENLY DISTRIBUTED FISSION PRODUCT MIXTURES.
V. Schuricht, D. Zappe, N. Eiteljoerge, and W. Noack. Jan 74, 32p
In German. U.S. Sales Only.

Descriptors: (*Fission products, Gamma dosimetry), (*Fallout, Gamma dosimetry), (*Gamma dosimetry, *Spatial dose distributions), Angular distribution, Energy spectra, Gamma radiation, Radiation detectors, Radiation doses, Shielding.

For abstract, see NSA 30 08, number 22967.

USC-113P-51 PC$4.00/MF$2.25
University of Southern California, Los Angeles.
INVARIANT IMBEDDING AND RADIATION DOSIMETRY. IX. INVERSE PROBLEM OF DETERMINING A PLANE SOURCE IN A FINITE ISOTROPICALLY SCATTERING TARGET SLAB. TECHNICAL REPORT NO. RB73-17.
R. Bellman, A. L. Fymat, S. Ueno, and R. Vasudevan. May 73, 17p
Contract AT(04-3)-113

Descriptors: (*Dosimetry, *Invariant imbedding), Distribution, Radiation sources, Scattering, Targets, Thickness.

For abstract, see NSA 30 08, number 22968.

USC-113P-69 PC$4.50/MF$2.25
University of Southern California, Los Angeles.
REFLECTION FUNCTION FROM A DOUBLE LAYER: A NEW APPROACH. TECHNICAL REPORT NO. RB73-42.
R. Bellman, and R. Vasudevan. Sep 73, 24p
Contract AT(04-3)-113

Descriptors: (*Radiation transport, *Reflection), Functions, Layers, Riccati equation, Scattering, Series expansion, Thickness, Transmission.

For abstract, see NSA 30 08, number 23494.

18I. Reactor Engineering and Operation

AEC-tr-7559 PC$4.50/MF$2.25
CEA, 75 - Paris (France). Dept. de Surete Nucleaire.
RELIABILITY AND AVAILABILITY OF A REPAIRABLE R/M ACTIVE REDUNDANCY SYSTEM.
J. P. Signoret. Jun 74, 30p
Translation of SETS report No. 20.

Descriptors: (*Reactor protection systems, *Reliability), Analytical solution, Availability, Failures, Probability, Statistics.

For abstract, see NSA 30 08, number 23164.

AEC-tr-7564 PC$7.75/MF$2.25
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine e.V., Koeln (F.R. Germany).
FAILURE RATE COMPILATION. SCIENTIFIC REPORTS.
H. P. Balfanz. 92p
Translation of IRS-W--8.

Descriptors: (*Electrical equipment, *Failures), (*Reactor components, Failures), Data compilation, Performance, Reactor safety, Reliability, Tables.

For abstract, see NSA 30 08, number 23165.

AECL-4830 PC$5.50/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario.
ANNUAL REPORT, 1973--1974.
17 May 74, 50p
U.S. Sales Only.

Descriptors: (*Canada, *Research programs), (*Nuclear power, Research programs), (*Radioisotopes, Research programs), Aecl, Budgets, Economics, Education, Hydroelectric power, Industry, International agreements, Management, Nuclear energy, Personnel, Planning, Power transmission.

For abstract, see NSA 30 08, number 23281.

AECL-4831 PC$7.00/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
SHUTOFF ROD EXPERIMENTS IN ZED-2.
A. Okazaki, and D. H. Walker. May 74, 77p
U.S. Sales Only.

Descriptors: (*Phwr type reactors, Scram rods), (*Scram rods, *Performance testing), Calibration, Configuration, Criticality, Data, Design, Neutron absorbers, Neutron flux, Reactivity, Reactor kinetics, Reactor period, Spatial distribution, Voids, Zed-2 reactor.

For abstract, see NSA 30 08, number 23222.

CONF-740609-5 PC$4.00/MF$2.25
Westinghouse Electric Corp., Madison, Pa. Advanced Reactors Div.
LIQUID METAL FAST BREEDER REACTOR SAFETY.
J. Graham. May 74, 14p

Descriptors: (*Fftf reactor, *Reactor safety), (*Lmfbr type reactors, Reactor safety), Containment systems, Flow blockage, Fuel assemblies, Reactor core disruption, Sodium.

For abstract, see NSA 30 08, number 23167.

EUR-5039 PC$4.50/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
PRESSURE HISTORY DURING FLASHING CAUSED BY A SUDDEN EXPANSION.
G. Friz, and W. Riebold. May 74, 29p
U.S. Sales Only.

Descriptors: (*Pwr type reactors, *Blowdown), Bubbles, Heat transfer, Hydraulics, Medium pressure, Reactor safety.

For abstract, see NSA 30 08, number 23168.

IRS-F-18 PC$20.00/MF$2.25
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine e.V., Koeln (F.R. Germany).
RESEARCH REPORTS (ANNUAL REPORTS). STATE: END OF 1973.
Mar 74, 336p
U.S. Sales Only.

Descriptors: (*Reactor safety, *Research programs), German federal republic, Reactor accidents, Safety engineering.

For abstract, see NSA 30 08, number 23169.

WASH-1328 PC$9.25/MF$2.25
USAEC Directorate of Licensing, Washington, D.C.
LEGISLATION TO AMEND THE PRICE-ANDERSON ACT. DRAFT ENVIRONMENTAL STATEMENT.
May 74, 124p

Descriptors: Accidents, Atomic energy laws, Environment, Fossil-fuel power plants, Liabilities, Nuclear insurance, Nuclear power plants.

For abstract, see NSA 30 08, number 23268.

ZJE-148 PC$4.25/MF$2.25
Skoda, Plzen (Czechoslovakia).
COOLANT DYNAMICS AND VIBRATIONS OF REACTOR COMPONENTS.
L. Pecinka. 1974, 24p
U.S. Sales Only.

Descriptors: (*Power reactors, Primary coolant circuits), (*Primary coolant circuits, *Mechanical vibrations), Blowers, Mathematical models, Pumps, Reactor components.

For abstract, see NSA 30 08, number 23191.

18J. Reactor Materials

ARH-SA-183 PC$4.75/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
DECONTAMINATION OF OBSOLETE PROCESSING FACILITIES AT HANFORD.
C. B. Foster, and M. J. Szulinski. 1 Jun 74, 32p
CONF-740608-15
Contract AT(45-1)-2130

Descriptors: (*Fuel reprocessing plants, *Decontamination), Bismuth phosphates, Containers, Equipment, Extraction columns, Nitric acid, Permanganates, Plutonium, Potassium compounds, Redox process, Solvent extraction, Spent fuels, Tbp, Uranium.

For abstract, see NSA 30 08, number 20826.

BNL-18969 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
METHOD TO DETERMINE THE MINIMUM COST MEASUREMENT PLAN CONSISTENT WITH ANY FEASIBLE LIMIT OF ERROR ON MUF.
J. P. Indusi, and W. Marcuse. 4 Jun 74, 19p CONF-740622-8

Descriptors: (*Fissile materials, Safeguards), (*Safeguards, Material unaccounted for), (*Material unaccounted for, *Errors), Cost.

For abstract, see NSA 30 08, number 21864.

DOCKET-50332-40 PC$25.75/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. SEPARATIONS FACILITY, LICENSE APPLICATION, FSAR, VOLUME 1, APPENDIX.
1974, 455p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Criticality, Geology, Radioactive waste disposal, Safety, Shielding, Site selection.

For abstract, see NSA 30 08, number 20828.

DOCKET-50332-41 PC$21.75/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. SEPARATIONS FACILITY, LICENSE APPLICATION, FSAR, VOLUME 2.
1974, 373p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Design, Reprocessing, Safety, Site selection, Spent fuels.

For abstract, see NSA 30 08, number 20829.

DOCKET-50332-42 PC$30.75/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. SEPARATIONS FACILITY, LICENSE APPLICATION, FSAR, VOLUME 3.
1974, 555p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Radioactive waste processing, Reprocessing, Safety, Spent fuels.

For abstract, see NSA 30 08, number 20830.

DOCKET-50332-43 PC$28.25/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. SEPARATIONS FACILITY, LICENSE APPLICATION, FSAR, VOLUME 4.
1974, 504p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Electric power, Radiation monitoring, Radioactive waste facilities, Radioactive waste management, Radioactive waste storage, Safety.

For abstract, see NSA 30 08, number 20831.

DOCKET-50332-44 PC$16.75/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. SEPARATIONS FACILITY, LICENSE APPLICATION, FSAR, VOLUME 5.
1974, 274p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Operation, Quality assurance, Radiation protection, Safety, Specifications.

For abstract, see NSA 30 08, number 20832.

DOCKET-50332-45 PC$24.00/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. SEPARATIONS FACILITY, TECHNICAL DESCRIPTION IN SUPPORT OF APPLICATION FOR FRSS OPERATIONS, JULY 1974.
Jul 74, 419p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Criticality, Operation, Radiation accidents, Radiation monitoring, Radiation protection, Reprocessing, Safety, Specifications, Spent fuels.

For abstract, see NSA 30 08, number 20833.

DOCKET-50332-46 PC$7.50/MF$2.25
Allied-Gulf Nuclear Services, Barnwell, S.C.
BARNWELL NUCLEAR FUEL PLANT. LICENSE APPLICATION, FSAR, AMENDMENT 9.
16 Jul 74, 88p

Descriptors: (*Barnwell fuel processing plant, *Licensing), Reprocessing, Safety, Spent fuels.

For abstract, see NSA 30 08, number 20834.

DPST-74-128-5 PC$4.75/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
EXP 238 PU FUEL FORM PROCESSES. SAVANNAH RIVER LABORATORY MONTHLY REPORT.
May 74, 32p
Contract AT(07-2)-1

Descriptors: (*Plutonium dioxide, *Fabrication), (*Radioisotope batteries, Fabrication), Air, Argon, Capsules, Hot pressing, Iridium, Milling, Plutonium 238.

For abstract, see NSA 30 08, number 21514.

EUR-5066 PC$7.50/MF$2.25
Commission of the European Communities, Luxembourg; Hochtemperatur-Reaktorbau G.m.b.H., Mannheim (F.R. Germany); Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany).
IRRADIATION OF PLUTONIUM FUELLED COATED PARTICLES IN FRJ 2.
J. Baier, H. Bairiot, J. Vangeel, and R. Van Sinay.
Feb 74, 86p
U.S. Sales Only.

Descriptors: (*Coated fuel particles, *Physical radiation effects), Burnup, Fast neutrons, Fission products, Frj-2 reactor, Gases, Layers, Neutron beams, Plutonium dioxide, Pyrolytic carbon, Silicon carbides, Very high temperature.

For abstract, see NSA 30 08, number 21515.

JAERI-M-5628 PC$7.50/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
COMPUTER PROGRAMS FOR THE ANALYSIS OF FUEL-ROD BEHAVIORS.
Y. Harayama, A. Morishima, F. Izumi, M. Fujita, and R. Yamada. Mar 74, 90p
In Japanese. U.S. Sales Only.

Descriptors: (*Fuel rods, *Mathematical models), Computer calculations, Computer codes, Fuel cans, High temperature, Irradiation, Performance, Spatial distribution, Strains, Stresses, Swelling, Temperature dependence, Time dependence.

For abstract, see NSA 30 08, number 23215.

KFK-EXT-9/74-1 PC$4.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Heisse Chemie.
AUTOMATION IN THE ANALYSIS OF NUCLEAR FUELS. A LITERATURE REVIEW FROM "NUCLEAR SCIENCE ABSTRACTS".
B. Nessi, and P. Groll. May 74, 30p
In German. U.S. Sales Only.

Descriptors: (*Nuclear fuels, *Bibliographies), Abstracts, Automation, Computers, Data processing, Reprocessing.

For abstract, see NSA 30 08, number 20837.

KFK-1945 PC$5.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Heisse Chemie.
CALCULATIONS AND COMPILATIONS OF COMPOSITION, RADIOACTIVITY, THERMAL POWER, GAMMA AND NEUTRON RELEASE RATES OF FISSION PRODUCTS, AND ACTINIDES OF SPENT POWER REACTORS FUELS AND THEIR REPROCESSING WASTES.
H. O. Haug. Apr 74, 50p
U.S. Sales Only.

Descriptors: (*Spent fuels, *After-heat), (*Fuel cans, After-heat), (*Radioactive wastes, After-heat), Burnup, Chemical composition, Fuel cycle, Gamma radiation, Isotope ratio, Neutrons, Quantity ratio, Radioactive waste processing, Radioactivity, Spent fuel storage, Time dependence, Waste storage, Water cooled reactors.

For abstract, see NSA 30 08, number 20836.

KFK-1952 PC$17.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Material- und Festkoerperforschung.
DESIGN, IRRADIATION, AND POST IRRADIATION EXAMINATION OF THE UO SUB 2 /PUO SUB 2 FUEL PIN IRRADIATION EXPERIMENTS OF THE FR 2 CAPSULE GROUP NO. 4B.
P. Weimar, T. Dippel, and D. Freund. Mar 74, 278p
In German. U.S. Sales Only.

Descriptors: (*Uranium dioxide, *Physical radiation effects), (*Plutonium dioxide, Physical radiation effects), Austenite, Burnup, Density, Fr-2 reactor, Fuel cans, Fuel pins, Irradiation capsules, Stainless steels, Thermal neutrons.

For abstract, see NSA 30 08, number 21520.

KFK-1953 PC$11.75/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
REACTION BEHAVIOR OF FISSION PRODUCTS IN CARBIDE AND NITRIDE FUEL BASED ON SIMULATED FUEL COMPOSITIONS.
E. Smailos. Mar 74, 171p
In German. U.S. Sales Only.

Descriptors: (*Uranium nitrides, *Chemical reactions), (*Yttrium nitrides, Chemical reactions), (*Lanthanum nitrides, Chemical reactions), Burnup, Fission products, Simulation, Solid solutions, Stoichiometry, Very high temperature, Cerium nitrides, Plutonium carbides, Uranium carbides, Plutonium nitrides.

For abstract, see NSA 30 08, number 21521.

KFKI-74-23 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
COBRA-3/KFKI, A DIGITAL COMPUTER PROGRAM FOR STEADY STATE AND TRANSIENT THERMAL-HYDRAULIC SUBCHANNEL ANALYSIS OF ROD BUNDLE NUCLEAR FUEL ELEMENTS.
L. M. Kovacs, J. Vigassy, and I. Toth. 1974, 20p
U.S. Sales Only.

Descriptors: (*Fuel assemblies, *Fluid flow), (*Computer codes, *C codes), Fuel rods, Heat transfer, Mathematical models, Two-phase flow.

For abstract, see NSA 30 08, number 23216.

LA-UR-74-794 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
SOME FUNNY THINGS HAPPENED ON THE WAY TO THE LIMIT OF ERROR STANDARD.
R. H. Moore. 1974, 10p CONF-740622-1
Contract W-7405-eng-36

Descriptors: (*Nuclear materials management, *Accounting), (*Material unaccounted for, *Errors), Inventories, Reliability, Statistics.

For abstract, see NSA 30 08, number 21867.

LA-5652-M PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
PASSIVE SEGMENTED GAMMA SCAN OPERATION MANUAL.
E. R. Martin, D. F. Jones, and L. G. Speir. Jul 74, 54p
Contract W-7405-eng-36

Descriptors: (*Fissile materials, *Safeguards), (*Plutonium 238, *Nondestructive analysis), (*Uranium 235, Nondestructive analysis), (*Plutonium 239, Nondestructive analysis), Computers, Gamma detection, Li-drifted ge detectors, Manuals, Nuclear materials management.

For abstract, see NSA 30 08, number 21866.

LFEN-152(B) PC$4.25/MF$2.25
National Inst. for Metallurgy, Johannesburg (South Africa).
RECOVERY OF URANIUM FROM THE NISA ORE. STUDY OF A HIGH-GRADE SAMPLE.
C. F. F. Da Silva Santos, and P. A. Laxen. 1973, 32p
U.S. Sales Only.

Descriptors: (*Uranium ores, *Ore processing), Adu, Alkanes, Amines, Ammonium uranates, Chlorides, Flowsheets, Leaching, Mineralization, Radiometric analysis, Roasting, Solvent extraction, Solvent properties.

For abstract, see NSA 30 08, number 20729.

N74-30338/9GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
ON THERMAL STRESS FAILURE OF THE SNAP-19A RTG HEAT SHIELD.
W. C. Pitts, and L. A. Anderson. Jul 74, 12p
NASA-TM-X-3097, A-5516

Descriptors: *Failure, *Heat shielding, *Snap 19, *Thermal stresses, Graphite, Stress analysis, Thermal shock.

For abstract, see STAR 1219

PATENT-3 782 924 Not available NTIS
Atomic Energy Commission, Washington, D.C.
FINE-GRAINED ZIRCONIUM-BASE MATERIAL.
Patent,
George Robert Van Houten. Filed 26 Nov 62, patented 1 Jan 74, 2p PAT-APPL-240 187
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Zirconium, *Grain refinement, *Patents, Zirconium alloys, Uranium alloys, Nuclear fuel elements, Carbon, Vacuum melting.
Identifiers: PAT-CL-75-122-5.

The patent describes a method of making zirconium with inhibited grain growth characteristics, by the process of vacuum melting the zirconium, adding 0.3 to 0.5% carbon, stirring, homogenizing and cooling. Zirconium metal, zirconium-base alloys, and in particular zirconium-uranium alloys containing from 2 to 10 weight percent of uranium are intended; the term is also to include hydrides of such materials. The zirconium-base materials just described are used, for instance, as moderators in nuclear reactors or, if uranium-containing, as fuel or fuel-moderator combinations in nuclear reactors.

PATENT-3 798 124 Not available NTIS
Atomic Energy Commission, Washington, D.C.
FUEL SUBASSEMBLY FOR NUCLEAR REACTOR.
Patent,
Richard C. Noyes. Filed 27 May 69, patented 19 Mar 74, 3p PAT-APPL-828 269
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Nuclear fuel assemblies, *Patents, Moderators.

The patent describes a circular cylinder nuclear fuel subassembly. It has extended circumferentially spaced containers of moderating material along the outer periphery to permit a plurality of subassemblies to be assembled in contact with each other and the containers occupying the spaces between the subassemblies.

RT/ING-(74)6 PC$4.75/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
METHOD OF MODELS IN THE REPRODUCTION OF THE BURN-OUT PHENOMENON OF WATER WITH FREON.
M. Cumo, C. Maciuca, M. Moronesi, and G. Palazzi. Feb 74, 31p
In Italian. U.S. Sales Only.

Descriptors: (*Water cooled reactors, Fuel elements), (*Fuel elements, *Burnout), Freons, Scaling, Simulation.

For abstract, see NSA 30 08, number 23217.

SGAE-2260 PC$4.75/MF$2.25
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Seibersdorf. Abt. Mathematik.
SOFTWARE FOR COATED PARTICLES ANALYSIS.
G. M. Jakubczyk, and W. Krotz. Apr 74, 31p
In German. U.S. Sales Only.

Descriptors: (*Coated fuel particles, *Fabrication), Camac system, Computers, Control systems, Inspection, Pdp computers, Programming, Surface coating.

For abstract, see NSA 30 08, number 21524.

TUBIK-30 PC$6.75/MF$2.25
Technische Univ. Berlin (F.R. Germany). Inst. fuer Kerntechnik.
CALCULATION OF THE TEMPERATURE DISTRIBUTION FOR AN ECCENTRIC SPHERICAL LAYER WITH CONSTANT HEAT FLUX ON INNER SURFACE AND CONSTANT TEMPERATURE ON OUTER SURFACE.
H. Sprenger, and L. Wolf. Apr 74, 74p
In German. U.S. Sales Only.

Descriptors: (*Coated fuel particles, *Temperature distribution), (*Computer codes, *T codes), Coatings, Computer calculations, Configuration, Heat transfer, Numerical solution, Spheres, Temperature dependence, Thermal conductivity.

For abstract, see NSA 30 08, number 23218.

UCRL-51605 PC$5.45/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
SIMULATION STUDY OF PLUTONIUM GAMMA RAY GROUPINGS FOR ISOTOPIC RATIO DETERMINATION.
R. Gunnink. 10 Jun 74, 58p

Contract W-7405-eng-48

Descriptors: (*Plutonium, *Isotope ratio), (*Safeguards, *Gamma spectroscopy), Computer calculations, Nondestructive analysis, Nuclear materials management, Simulation.

For abstract, see NSA 30 08, number 21868.

18K. Reactor Physics

CONF-740710-3 PC$4.75/MF$2.25
Argonne National Lab., Ill.
MONTE CARLO WORK AT ARGONNE NATIONAL LABORATORY.
E. M. Gelbard, and R. E. Prael. Jul 74, 34p

Descriptors: (*Reactor kinetics, Monte carlo method), (*Monte carlo method, *Mathematical models), Accuracy, Computer codes, Eigenvalues, Errors, Matrices, V codes.

For abstract, see NSA 30 08, number 23179.

FEI-444 PC$5.25/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk. Fiziko-Ehnergeticheskij Inst.
REFINEMENT OF GROUP CONSTANTS AND CALCULATED VALUES OF FUNCTIONALS AS A RESULT OF A SERIES OF EXPERIMENTS ON THE CRITICAL ASSEMBLIES BFS.
A. A. Van'kov, and A. I. Voropaev. 1973, 45p
In Russian. U.S. Sales Only.

Descriptors: (*Fast reactors, *Group constants), Bfs reactor, Corrections, Correlations, Errors, Functionals, Matrices, Reactor kinetics, Statistics, Zero power reactors.

For abstract, see NSA 30 08, number 23180.

ORNL-TM-4595 PC$5.45/MF$2.25
Oak Ridge National Lab., Tenn.
APPROXIMATE NUMERICAL SOLUTIONS TO THE TIME-DEPENDENT NEUTRON TRANSPORT EQUATION USING THE TASK ALGORITHM.
E. T. Tomlinson. Jul 74, 70p
Contract W-7405-eng-26

Descriptors: (*Reactor kinetics equations, *Boltzmann equation), Mathematical models, Neutron transport theory, Reactor kinetics, Time dependence.

For abstract, see NSA 30 08, number 23182.

18N. Snap Technology

AEC-tr-7565 PC$4.00/MF$2.25
USAEC Technical Information Center, Oak Ridge, Tenn.
REPORT ON THERMIONIC ACTIVITIES IN FRANCE.
20 May 74, 5p
Translation of Rapport sur les activites thermoelectroniques en France.

Descriptors: (*France, Thermionic reactors), (*Thermionic reactors, *Specifications), Reactor components, Reactor materials.

For abstract, see NSA 30 08, number 23160.

ALO-2832-46 PC$5.25/MF$2.25
Union Carbide Corp., Indianapolis, Ind. Linde Div.
EVALUATION OF A MOLYBDENUM FOIL–QUARTZ CLOTH INSULATION SYSTEM AFTER 18,000 HOURS AT A SOURCE TEMPERATURE OF APPROX.1100 EC (2012 EXP 0 F).
D. McLaughlin, J. J. Nowobilski, D. J. Webster, and R. Zawierucha. Jun 73, 43p

Contract AT(29-2)-2832

Descriptors: (*Radioisotope batteries, Thermal insulation), (*Thermal insulation, *Performance testing), Foils, Molybdenum, Quartz, Very high temperature.

For abstract, see NSA 30 08, number 21317.

ANSP-M-1 PC$6.25/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
REVIEW OF GRAPHITE ABLATION THEORY AND EXPERIMENTAL DATA.
L. L. Perini. Dec 71, 62p

Descriptors: (*Radioisotope heat sources, *Thermal shields), (*Graphite, *Ablation), (*Pyrolytic graphite, Ablation), (*Snap 19 battery, *Safety), Capsules, High temperature, Pioneer space probes, Reentry, Reviews, Sublimation, Very high temperature.

For abstract, see NSA 30 08, number 21318.

ANSP-M-2 PC$5.75/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
PIONEER F/SNAP 19 HEAT SOURCE ABLATION STUDIES.
D. W. Conn. Feb 72, 54p

Descriptors: (*Snap 19 battery, *Safety), (*Radioisotope heat sources, *Thermal shields), (*Graphite, *Ablation), (*Pyrolytic graphite, Ablation), Capsules, Erosion, High temperature, Oxidation, Pioneer space probes, Reentry, Sublimation, Very high temperature.

For abstract, see NSA 30 08, number 21319.

ANSP-M-3 PC$5.25/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
PIONEER F/SNAP 19 HEAT SOURCE THERMAL ANALYSIS.
D. W. Conn, and R. K. Frazer. Apr 72, 41p

Descriptors: (*Snap 19 battery, *Safety), (*Radioisotope heat sources, *Thermal shields), (*Graphite, *Ablation), (*Pyrolytic graphite, Ablation), Pioneer space probes, Reentry, Thermal analysis.

For abstract, see NSA 30 08, number 21320.

ANSP-M-4 PC$5.25/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
COMPILATION AND CORRELATION OF EXPERIMENTAL, HYPERSONIC, STAGNATION POINT CONVECTIVE HEATING RATES.
L. L. Perini. Jul 72, 45p

Descriptors: (*Space vehicles, *Reentry), (*Snap batteries, *Safety), Ablation, Aerodynamics, Convection, Data compilation, Gas flow, Heating, Hypersonic flow, Numerical solution, Shock tubes, Shock waves, Spheres, Stagnation.

For abstract, see NSA 30 08, number 21321.

ANSP-M-5 PC$5.00/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
CURVE FITS OF JANAF THERMOCHEMICAL DATA.
L. L. Perini. Sep 72, 37p

Descriptors: (*Snap batteries, *Safety), (*Elements, *Thermodynamic properties), (*Organic compounds, Thermodynamic properties), (*Inorganic compounds, *Computer calculations), Ablation, Enthalpy, Entropy, High temperature, Medium temperature, Reentry, Space vehicles, Tables, Temperature dependence, Ultrahigh temperature, Very high temperature.

For abstract, see NSA 30 08, number 21322.

ANSP-M-6 PC$6.50/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
USERS MANUAL FOR THE 3DOF TRAJECTORY COMPUTER PROGRAM.
L. L. Perini. Sep 73, 66p

Descriptors: (*Snap batteries, *Safety), (*Computer codes, *Number codes), (*Space vehicles, *Reentry), Manuals, Trajectories.

For abstract, see NSA 30 08, number 21323.

ANSP-M-7 PC$5.50/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
EVALUATION OF METHODS USED TO DETERMINE TEMPERATURES OF CONVECTIVELY HEATED SOLID SURFACES.
J. D. Randall. Jan 74, 49p

Descriptors: (*Snap batteries, *Safety), (*Space vehicles, *Reentry), Ablation, Convection, Numerical solution, Slabs.

For abstract, see NSA 30 08, number 21324.

ANSP-M-8 PC$5.75/MF$2.25
Johns Hopkins Univ., Silver Spring, Md. Applied Physics Lab.
ORBITAL LIFETIME ESTIMATES.
L. L. Perini. Feb 74, 54p

Descriptors: (*Snap batteries, *Safety), (*Space vehicles, Orbits), (*Orbits, *Lifetime), Radioisotope heat sources.

For abstract, see NSA 30 08, number 21325.

DPST-74-128-6 PC$4.25/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
SAVANNAH RIVER LABORATORY MONTHLY REPORT: EXP 238 PU FUEL FORM PROCESSES.
Jun 74, 21p
Contract AT(07-2)-1

Descriptors: (*Plutonium 238, Radioisotope heat sources), (*Radioisotope heat sources, *Research programs), (*Thermoelectric generators, Radioisotope heat sources), Flowsheets, Savannah river plant.

For abstract, see NSA 30 08, number 21326.

LA-5506-PR PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
PREPARATION AND EVALUATION OF MEDICAL-GRADE PLUTONIUM-238 FUELS, JULY 1, 1971–JUNE 30, 1973.
L. J. Mullins. May 74, 46p
Contract W-7405-eng-36

Descriptors: (*Mechanical heart, Radioisotope heat sources), (*Radioisotope heat sources, *Fabrication), (*Plutonium 238, Mechanical heart), Capsules, Chemical analysis, Chemical preparation, Chemical properties, Helium, Isotope ratio, Physical properties, Plutonium oxides, Radon, Research programs, Welding.

For abstract, see NSA 30 08, number 21327.

LA-5622-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
RELATIONSHIP OF FABRICATION PARAMETERS TO SELECTED PROPERTIES OF EXP 238 PUO SUB 2 RADIOISOTOPIC FUELS. I.

DIMENSIONAL CHANGES, STOICHIOMETRIES, AND MICROSTRUCTURAL FEATURES.
T. K. Keenan, R. A. Kent, and R. W. Zocher. May 74, 19p
Contract W-7405-eng-36

Descriptors: (*Plutonium dioxide, *Chemical properties), Dimensions, Fabrication, Microstructure, Physical properties, Plutonium 238, Radioisotope batteries, Thermoelectric generators.

For abstract, see NSA 30 08, number 21523.

MLM-2166 PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.
MOUND LABORATORY ISOTOPIC POWER FUELS PROGRAMS: JANUARY--JUNE 1974.
9 Aug 74, 25p
Contract AT-33-1-GEN-53

Descriptors: (*Plutonium 238, Radioisotope heat sources), (*Thermoelectric generators, Radioisotope heat sources), (*Radioisotope heat sources, *Research programs), Plutonium oxides.

For abstract, see NSA 30 08, number 21328.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-785 619/8GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J Feltman Research Labs
PHOTO- AND ELECTRIC FIELD-EFFECTS IN ENERGETIC MATERIALS,
David S. Downs, Wayne Garrett, Donald A. Wiegand, Thaddeus Gora, and Marcel Blais. 1973, 16p

Descriptors: *Detonations, *Lead azides, Explosives, Band theory of solids, Decomposition, Electric fields, Photochemical reactions, Charge carriers.
Identifiers: Chemical reaction mechanisms, *Photoelectronic initiation(Explosives).

The report discusses the photoelectronic initiation effect in solid explosives. This comprises the simultaneous action of light and an electric field to initiate decomposition and detonation. A mechanism is proposed which concerns the avalanching of charge carriers. Reference is made to experimental data on lead azide.

AD-785 622/2GA PC$3.25/MF$2.25
Frankford Arsenal Philadelphia Pa
RAPID CASE DESIGN USING FINITE ELEMENT STRESS ANALYSIS AND NASTRAN,
Diana L. Frederick, and John E. Higgins. 1973, 16p

Descriptors: *Cartridge cases, Stresses, Structural response, Pressure, Aspect ratio, Elastic properties, Plastic properties.
Identifiers: Finite element analysis, NASTRAN computer program, CRTPLS computer program, Computer aided design, Case neck separation.

The finite element approach to structural analysis came into being with large scale scientific computers. Implementation of the finite element approach to structural analysis lagged behind the theory until the release of CRTPLS and NASTRAN in 1970. The release of these programs provided a substantial analytic capability at a low cost. Although there are many technical improvements to come, the primary challange is the effective use of existing capabilities and efficient design of structures. This paper concerns this challenge and how it applies to product engineering of ammunition components.

AD-785 649/5GA PC$3.25/MF$2.25
Army Electronics Technology and Devices Lab Fort Monmouth N J
DESIGN OF MAGNETIC SENSORS FOR OBTAINING AN ENVIRONMENTAL SAFETY SIGNATURE,
Herbert A. Leupold, Frederick Rothwarf, Carl J. Campagnoulo, Jonathan E. Fine, and Henry Lee. 1974, 16p
Prepared in cooperation with Harry Diamond Labs., Washington, D.C.

Descriptors: *Projectiles, *Fin stabilized ammunition, *Arming devices, Magnetic detectors, Magnetic signatures, Transducers, Firing tests(Ordnance), Experimental design.

The safing and arming systems of most artillery projectiles in common use have a signature provided by setback forces arising from the acceleration of the projectile upon firing. To obviate the possibility of accidental arming through dropping or jolting of a round, a second signature is desirable. In fin-stabilized rounds, since spin is absent, a means must be found for supplying the second arming signature. To obtain such a signature it was decided to employ two magnetic transducers positioned near the surface of the projectile. These transducers sense a change in magnetic flux when the projectile leaves the permeable gun barrel, and emit an electrical pulse that activates a piston motor in the arming mechanism which in turn completes the arming process.

AD-785 654/5GA PC$3.25/MF$2.25
Harry Diamond Labs Washington D C
NEW AND IMPROVED TECHNOLOGIES FOR MILITARY TIME FUZING APPLICATIONS,
Joseph W. Miller, Jr. 1971, 15p

Descriptors: *Time fuzes, *Technology, Metal oxide semiconductors, Integrated circuits, Power supplies, Fire control computers, Fuze functioning elements.

The application of several new technologies has improved military time fuzing so that it can now satisfy a number of projected weapon system requirements. This improved time fuzing which uses electronic rather than mechanical clocks can be characterized by ease of setting, accuracy, reliability, and direct interfacing with fire control computers. The new technologies involved in this advanced fuzing effort include the metal nitride oxide semiconductor (MNOS) nonvolatile memory, monolithic and hybrid integrated electronics, and unique power supplies. These technologies and how they have been applied in variations of a multipurpose time fuze at the Harry Diamond Laboratories is the subject of this paper.

AD-785 680/0GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
THE EFFECT OF EXPLOSIVE DETONATION CHARACTERISTICS ON SHAPED CHARGE PERFORMANCE,
Julius Simon. 1974, 15p

Descriptors: *Shaped charges, *Shaped charge jets, Detonations, Penetration, Terminal ballistics, Strain rate, Kinetic energy.

The jet formation caused by the collapse of a shaped charge liner is dependent upon the pressure delivered to the liner wall by the detonating explosive. As a shaped charge liner is collapsed axisymmetrically to the charge axis by a detonation wave to form a jet and a slug, the liner material experiences plastic deformation at exceedingly high strain rates. If the jet is presumed to form simultaneously on the axis, and then stretch uniformly, a one dimensional approximation shows that strain rates characteristic of this process are 10,000/second. It is assumed that the jet is a ductile material which remains continuous during stretching. The purpose of this study was to determine the influence of explosive filler on shaped charge warhead performance.

AD-785 688/3GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
BOUNDARY-LAYER STUDIES ON SPINNING BODIES OF REVOLUTION,
Walter B. Sturek. 1973, 15p

Descriptors: *Spin stabilized ammunition, Spinning(Motion), Magnus effect, Boundary layer transition, Aerodynamic drag, Projectiles, Angle of attack.

This paper describes some results from a series of experimental studies of the viscous boundary-layer on spinning bodies of revolution. The objectives of these studies are: (1) provide data which will help guide the development of a useful procedure for computing Magnus effects on aerodynamic shapes of interest in artillery projectile design; (2) verify the significance of the boundary-layer configuration--laminar, transitional, turbulent--on the resulting Magnus force; and (3) develop a better understanding of the physics of the three-dimensional boundary-layer on spinning bodies of revolution at angle of attack.

AD-785 691/7GA PC$3.25/MF$2.25
Edgewood Arsenal Aberdeen Proving Ground Md
CONTROLLED FIREBALLS - EFFECTIVE KILL MECHANISMS FOR FLAMMABLE TARGETS,
Milton A. Tulis, Lawrence D. Whiting, II, and George E. Roberts. 1974, 15p

Descriptors: *Flame weapons, *Incendiary ammunition, Combustion, Flammability, Ignition, Triethylaluminum, Heat flux.

A predictive mathematical model has been devised for a variety of targets to be defeated with flame and incendiary agents and then used to tailor-make the agent for the specific weapon system available or under consideration. The research performed has included the collection, compilation, generation, and collation of energy requirements data for thermal defeat, combustion of flammables, or weakening of physical properties of nonflammable military targets. These data, when used with predictive mathematical models and computer-aided studies, have permitted the generation of destructive indexes for a variety of target materials and the development of agent formulations for effective flame systems. The predictive models have guided research with thickened triethylaluminum, TEA, a pyrophoric flame agent which has led to an effective flame kill mechanism - the controlled fireball.

AD-785 692/5GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J
ADVANCES IN EXPLOSIVE TRAIN TECHNOLOGY,
Wallace E. Voreck, Thomas Costain, and Everett W. Dalrymple. 1974, 16p

Descriptors: *Explosive trains, Fuzes(Ordnance), Detonators, Detonations, Sensitivity, Quality control.
Identifiers: M-55 detonators.

The proper functioning of any munition system depends on the reliable initiation of successive elements in an explosive train and on the transfer of sufficient energy from one element to another so that the fuze ultimately detonates a main charge. Some of the recent investigations made on explosive train technology by the Explosives Division of the Feltman Research Laboratory at Picatinny Arsenal are discussed. The purpose of this work is to develop a better understanding of how explosive trains function, provide the basis for improved quality control, and define and determine the parameters needed for new and improved designs. Use was made of new high speed transient recording equipment, and computer programs were developed and used for data reduction and analysis.

AD-785 700/6GA PC$3.25/MF$2.25
Frankford Arsenal Philadelphia Pa
DEFORMATION TEXTURES OF SHEAR SPUN SHAPED CHARGE LINERS,
Fred Witt. 1973, 16p

Descriptors: *Shaped charges, *Manufacturing, Terminal ballistics, Deformation, Shear stresses, Velocity, Texture, Slip casting, Copper, Grain structures(Metallurgy).
Identifiers: *Shaped charge liners.

The shape, volume, and depth of the crater produced by a shaped charge liner is governed by the length and continuity of the jet which strikes the target. Jet behavior, in turn, is strongly influenced by the crystalline properties of the liner materials from which it is formed. Evidence is presented for the existence of preferred slip planes and slip directions in explosively loaded copper specimens. Equipment is described which affords an approach to liner improvement through texture control. This approach recognizes those textural components useful for providing efficient and continuous jets. Quantitative pole figures may be used to describe preferred orientation in deep drawn ammunition components and shaped charge liners.

AD-785 839/2GA PC$3.25/MF$2.25
Case Western Reserve Univ Cleveland Ohio
BLAST-RESISTANT MINE CLEARING WHEELS (CAST STEEL).
Final technical rept.,
W. J. Evans, N. Makrides, and J. F. Wallace. 9 Jul 74, 25p
Contract DAAK02-73-C-0522

Descriptors: *Land mines, *Mine clearance, *Wheels, *Fabrication, Casting, Molds(Forms), Heat treatment, Mine countermeasures.
Identifiers: Steel HY-80, Steel HY-100.

The work was designed to permit evaluation and comparison of prototype mine clearing wheels based on several variables: design of wheel shape; composition and properties of five steels; and comparison of steel castings with steel forgings produced under a separate contract. The work discussed in this report refers only to cast steels. Details of all phases of production and testing as contracted are presented, including: pattern design, molding materials and technique, melting procedure, cleaning, quality assurance programs, heat treating and mechanical testing as required.

AD-785 980/4GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
EFFECT OF IMPURITIES ON EXCITATION AND DETONATION PROGRESSION IN SOME INORGANIC PRIMING AZIDES,
Yu. N. Sukhushin, and Yu. A. Zakharov. 20 Sep 73, 8p Rept no. FSTC-HT-23-916-73
Trans. of Politekhnicheskii Institut, Tomsk. Izvestiya (USSR) n199 p100-104 1969.

Descriptors: *Azides, *Detonations, Sensitivity, Shock tests, Impurities, Translations, USSR, Lead azides.

Shock sensitivity and detonation rate were studied in the following systems: lead azide-silver azide, in lead azide-rich corners of the system lead azide-copper azide(II), and in the silver azide-rich corners of the system silver azide-copper azide(II).

AD-785 989/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
BORON REACTIONS IN AN EXPLOSION,
V. I. Penekin, M. N. Makhov, and A. Ya. Apin. 3 Dec 73, 9p Rept no. FSTC-HT-23-1281-73
Trans. of Fizika Goreiya i Vzryva (USSR) v6 n1 p135-138 1972.

Descriptors: *Explosions, *Boron, *Heat of reaction, Chemical reactions, RDX, PETN, Carbides, Nitrides, Oxidation, Translations, USSR, Boranes.

Reactions of boron and orthoborane in explosions of their mixtures with RDX and PETN were studied. A certain optimum content of boron in explosive mixtures was found, beyond which excessive formation of energetically unfavorable carbides and nitrides takes place. Orthoborane affects explosion energy unfavorably, since energy is used to break the chemical bonds and the hydrogen and carbon content of the mixtures is increased.

AD-786 252/7GA Reprint
Polytechnic Inst of New York Farmingdale
VISCOUS FLOW OVER SPINNING CONES AT ANGLE OF ATTACK,
T. C. Lin, and S. G. Rubin. 24 Jan 74, 12p Rept no. PI-AE/AM-73-15
Grant AF-AFOSR-1843-70
Revision of report dated 13 Sep 73. Prepared in cooperation with National Aeronautics and Space Administration, Huntsville, Ala. George C. Marshall Space Flight Center.
Availability: Pub. in AIAA Jnl., v12 n7 p975-985 Jul 74.

Descriptors: *Spin stabilized ammunition, *Magnus effect, *Viscous flow, Angle of attack, Finite difference theory, Laminar flow, Boundary layer.

A numerical finite-difference method is developed for evaluating the Magnus coefficients on spinning cones in laminar flow. The merged layer, the strong interaction region, the downstream boundary layer and boundary region are all considered. The numerical method is an iterative predictor-corrector scheme developed for three-dimensional flow with or without crossflow diffusion. This method is particularly useful for problems in which a symmetry plane does not exist. Several contributions to the Magnus force and moments are considered. These include asymmetries in displacement thickness, centrifugal force and crossflow shear, and the effects of crossflow separation and vortex formation. Comparisons are made with experimental data and other theoretical analyses. (Author)

MLM-2114 PC$4.50/MF$2.25
Mound Lab., Miamisburg, Ohio.
ELASTIC RING COMPRESSION CRIMPING ASSEMBLY PROCESS FOR THE MC1957A PROGRAM.
T. K. Ferguson. 21 Jun 74, 28p
Contract AT-33-1-GEN-53

Descriptors: (*Detonators, *Fabrication), Closures, Compression, Design, Dimensions, Elasticity, Neoprene, Rings, Rubbers, Tools.

For abstract, see NSA 30 08, number 23466.

19C. Combat Vehicles

AD-785 627/1GA PC$3.25/MF$2.25
Army Tank-Automotive Command Warren Mich
A TECHNIQUE FOR THE VALIDATION OF VEHICLE MODELS USING THE ROAD SIMULATOR,
James W. Grant. 1973, 14p

Descriptors: *Tanks(Combat vehicles), Mobility, *Mathematical models, Terrain, Waterproofing, Models, Simulation.
Identifiers: *Surface mobility, Computer aided design.

The report discusses the process from the vehicle concept to prototype field testing in first formulating a mathematical model using the dynamic equations of motion for the suspension system and relevant components of a vehicle concept; then subjecting the model to the mission profile for which the vehicle is intended.

19D. Explosions, Ballistics, and Armor

AD-785 607/3GA PC$3.25/MF$2.25
Army Mobility Equipment Research and Development Center Fort Belvoir Va
HYPERVELOCITY IMPACT SHOCK-INDUCED DAMAGE TO STEEL ARMOR,
John W. Bond, Jr. 1973, 15p

Descriptors: *Hypervelocity projectiles, *Armor, *Terminal ballistics, Spallation, Steel, Martensite, Fragmentation, Damage, Cratering, Shear stresses, Impact.

A research program has been conducted to design hypervelocity projectiles that maximize back-face spallation in steel armor. The primary target for the experimental program has been steel armor 2 to 5 cm thick. After impact, the target specimens were dissected through the crater center, polished, etched, and examined metallurgically. Experimental results are summarized, and the 130-kbar phase change and spall phenomena are discussed.

AD-785 621/4GA PC$3.25/MF$2.25
Aberdeen Proving Ground Md Materiel Testing Directorate
AUTOMATIC SHELL FRAGMENT MEASURING TECHNIQUE,
James W. Fasig. 1974, 12p

Descriptors: *High explosive ammunition, *Fragmentation, *Test facilities, Automation, Control, Measurement, Integrated circuits.

The report briefly describes procedures and facilities used in testing high explosive warheads and the automated shell fragment measuring system.

AD-785 659/4GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
SEQUENCE LASER INTERFEROMETRY IN A MUZZLE JET FLOW SIMULATOR,
Fritz H. Oertel. 1974, 16p

Descriptors: *Launch tubes, *Jets, Jet flow, Lasers, Interferometers, Exterior ballistics, Blast.
Identifiers: *Transitional ballistics.

This paper describes a technique found useful to obtain several sequence laser interferograms of jet flow development. From these (finite fringe) interferograms, the density distribution in the entire flow field may, in principle, be obtained using the reduction technique. Sample interferograms, as well as spark shadowgrams which show qualitative details of the flow to support the interferograms, are shown and discussed. Some quantitative results are presented.

AD-785 665/1GA PC$3.25/MF$2.25
Rock Island Arsenal Ill
BALLISTIC TAILORING OF CASED/CONSOLIDATED FULLY TELESCOPED AMMUNITION,
Thomas J. Redling, and Leon Scott. 1974, 15p

Descriptors: *Ammunition, *Interior ballistics, *Automatic weapons, Cook off, Erosion, Fouling, Vulnerability, Dynamics, Separation.

The configuration of the Advanced Medium Caliber (AMC) 30mm ammunition allows separation and control of many of the variables which affect telescoping dynamics. Investigation of these parameters shows that telescoped ammunition can have a number of degrees of freedom not possible in the design of conventional ammunition. Through the use of these degrees of freedom, the telescoping dynamics can be controlled to produce a round with low ballistic variability.

AD-785 681/8GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J Feltman Research Labs
EXPERIMENTAL AND THEORETICAL MODELING OF FUEL-AIR DETONATIONS: THE DISTRIBUTED BLAST CONCEPT,
Norman Slagg, Pai-Lien Lu, and Barry Fishburn. 1973, 16p

Descriptors: *Detonations, *Ignition, Fuels, Heterogeneity, Explosions, Shock waves, Aerosols, Drops, Liquids, Dispersing, Solid propellants, Films.

The authors present an analysis of results obtained in developing experimental techniques, defining critical explosive parameters and evolving a theoretical model for heterogeneous detonation. The dispersions may be of the fuel-air type, or of the monopropellant type, where no external oxygen is required. Alternatively, the explosive may exist as a film on a surface. Most studies have centered on the detonation of clouds of liquid fuel drops in air. Experimental and theoretical studies have been performed to determine the interrelationships between chemical and physical factors in the ignition of liquid fuel drops by shock waves. A theoretical model has been developed to describe the complex process by which large liquid drops are fragmented. Theoretical comparisons are presented of the pressure and impulses generated by fuel-air clouds of different geometries and those from high explosives of equivalent weight and energy. In addition other types of heterogeneous detonation are considered. They include the use of solid fuel and film detonations.

AD-785 696/6GA PC$3.25/MF$2.25
Army Materials and Mechanics Research Center Watertown Mass
THE PREPARATION AND BALLISTIC EVALUATION OF TRANSPARENT POLYURETHANE BLOCK COPOLYMERS BASED ON 2,4-TOLUENE DIISOCYANATE,
Anthony F. Wilde, Richard W. Matton, Joseph M. Rogers, and Stanley E. Wentworth. 1973, 16p

Descriptors: *Polyurethane resins, *Terminal ballistics, *Armor, Copolymerization, Synthesis(Chemistry), Curing, Molecular weight, Transparence, Molecular structure.
Identifiers: Copolymers, Isocyanic acid/(methylphenylene-ester), Poly(oxytetramethylene), Butane diols.

The report describes synthesis and ballistic performance of a polyurethane block copolymer for transparent armor. It was formulated from 2,4-toluene diisocyanate, polytetramethylene oxide, and 1,4-butanediol. Curing parameters and composition are discussed with regard to ballistic performance.

AD-785 847/5GA PC$4.25/MF$2.25
Naval Weapons Lab Dahlgren Va
FINITE DIFFERENCE CALCULATIONS OF THE FREE-AIR BLAST FIELD FOR AN 8'/36 GUN.
Technical rept.,
G. SooHoo. Jun 74, 61p Rept no. NWL-TR-3122

Descriptors: *Guns, *Interior ballistics, Blast, Breech mechanisms, Recoil mechanisms, Smoke, Mathematical models, Numerical analysis, Hydrodynamic codes.
Identifiers: Design.

A two-dimensional hydrodymanic code has been used to simulate the free air blast field and post ejection internal ballistics of an 8'/36 gun, under consideration for development. The code is a two-material version of SHELLTIC and allows for a distinction between propellant gases and ambient air. The presence of a projectile was also considered in the calculations. The numerical analysis was carried out until 28.8 msec after projectile base ejection to enable the shock wave aft of the muzzle to reach the crew area. Results are presented for the blast propagation, with particular emphasis on the gun crew area. The post ejection internal ballistic are examined. The development and material composition of the smoke ring are shown. The shock bottle formation, steady configuration, and collapse can be followed. (Author)

AD-785 889/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THE CALCULATION OF DETONATION WAVE PARAMETERS IN GASES AND TWO-PHASE SYSTEMS,
A. A. Borisov, and B. E. Gelfand. 3 Oct 73, 15p
Rept no. FSTC-HT-23-1208-73
Trans. of Fizika Goreniya i Vzryva (USSR) v6 n2 p186-195 1970.

Descriptors: *Detonation waves, Pressure, Temperature, Velocity, Thermodynamics, Translations, USSR.

A simplified method of calculating the parameters of detonation waves (i.e., pressure, temperature, velocity, et al.) is developed. The calculations were divided into two parts wherever possible: the calculation of the thermodynamically equilibrium characteristics for a given temperature and pressure and the determination of the parameters of the detonation waves. The results of the calculation were compared with the results of experiments investigating detonation waves in acetylene. The difference between the two sets of results was probably related to incomplete heat liberation of carbon condensation, the loss of energy in the wave, etc. The diameter of the pipe in which the experiment is performed is another one of the factors which can affect the results of experiments.

AD-786 056/2GA Reprint
Frankford Arsenal Philadelphia Pa
APPLICATIONS OF STRAIN GAGES TO BALLISTIC PROBLEMS,
Paul D. Flynn. 1974, 11p Rept no. FA-TA-74008
Availability: Pub. in The Shock and Vibration Bulletin, n43 p95-102 Jun 73.

Descriptors: *Ballistic testing, *Strain gages, Gun barrels, Interior ballistics, Firing tests(Ordnance), Shock(Mechanics), Vibration.

This paper describes several ballistic problems in which external surface strain gage measurements were used to determine internal ballistic pressures, to detect projectiles in gun barrels for the purpose of synchronizing other instrumentation such as flash X-rays, and to study various ballistic phenomena. A brief review of the strain gage method is given, but the emphasis is on novel applications which may be of general interest to ballisticians and to the shock and vibration community. (Author)

AD-786 060/4GA Reprint
Frankford Arsenal Philadelphia Pa
A SIMPLE TRANSDUCER FOR DETECTING PROJECTILES IN GUN BARRELS,
P. D. Flynn, J. T. Gilbert , and E. A. Webster, Jr. 1974, 6p Rept no. FA-TA-74009
Availability: Pub. in Experimental Mechanics, v13 n8 p350-352 Aug 73.

Descriptors: *Ballistic testing, *Strain gages, Gun barrels, Interior ballistics, Transducers, Firing tests(Ordnance), Projectiles, Detection.

Strain gages were cemented on an adjustable hose clamp. The strain-gaged hose clamp was used as a simple transducer on gun barrels to detect projectiles during firing in order to synchronize other instrumentation, such as high-speed flash X rays and a pulsed-laser holographic camera, with a reproducibility of the order of one microsecond. (Author)

AD-786 173/5GA PC$3.75/MF$2.25
Physics International Co San Leandro Calif
EXPERIMENTAL REPORT OF CRATERING, DISPLACEMENT, AND EJECTA PROCESSES.
Final rept. 2 Jan 74-30 Aug 74,
K. Seifert, and D. Maxwell. Aug 74, 42p Rept no. PITR-659-1 DNA-3382T
Contract DNA001-74-C-0151

Descriptors: *Cratering, *Ejecta, Laboratory tests, Simulation, Deformation, Underground explosions.

Three experimental cratering test series are reported for sand and plasticene (1) Final craters and displacements; (2) Flash X-ray photos of crater ejecta development (3) Measurements of ejecta mass. (Author)

AD-786 282/4GA Reprint
Technion - Israel Inst of Tech Haifa Material Mechanics Lab
ANALYSIS OF THE MECHANICS OF PERFORATION OF PROJECTILES IN METALLIC PLATES,
J. Awerbuch, and S. R. Bodner. 16 Jul 73, 15p
Contract F44620-72-C-0004
Availability: Pub. in International Jnl. of Solids Structures, v10 p671-684 1974.

Descriptors: *Projectiles, *Terminal ballistics, Metal plates, Armor plate, Penetration, Perforation, Ballistic testing, Mathematical models.

A mathematical model has been developed to describe the mechanism of normal perforation of projectiles in metallic targets. The perforation process is considered to be divided into three interconnected stages. The analysis accounts for an effective mass of the bullet due to part of the target material moving with the bullet, the deformation of the bullet during penetration, and the increased strength of the target material at high rates of loading. The analysis enables the residual velocity to be calculated as a function of the target thickness and its mechanical and physical properties, and of the mass, geometry and impact velocity of the projectile. The geometry of the cavity, i.e. entrance and exit diameters and plug thicknesses, are factors in the analysis and are empirical quantities. The present theory can also predict the force-time curve and the contact time for the perforation process. (Author)

SAND-74-5235 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
SIMPLIFIED BLAST NUISANCE PREDICTIONS FOR SMALL EXPLOSIONS.
J. W. Reed. 9 Jul 74, 14p

Descriptors: (*Chemical explosions, *Noise), (*Explosions, Noise), Detonations, Earth atmosphere, Motion, Residences, Temperature measurement, Velocity, Wave propagation, Weather, Wind.

For abstract, see NSA 30 08, number 23343.

UCID-16557 PC$7.75/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
PARTICIPATION OF LLL IN JSEXP. PART A. PERFORMANCE OF NON-IDEAL HE. PART B. CHARACTERIZATION OF ECX FOR CONVENTIONAL MUNITIONS.
F. E. Walker. 30 Jun 74, 92p
Contract W-7405-eng-48

Descriptors: (*Chemical explosives, *Performance testing), Composite materials, Detonations, Economics, Hydrodynamics, Kinetics, Management, Materials working, Processing, Research programs, Shape.

For abstract, see NSA 30 08, number 23434.

UCRL-51319 PC$15.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.

PROPERTIES OF CHEMICAL EXPLOSIVES AND EXPLOSIVE SIMULANTS.
B. M. Dobratz. 15 Dec 72, 237p
Contract W-7405-Eng-48

Descriptors: (*Chemical explosives, *Performance testing), Bibliographies, Chemical properties, Detonations, Manuals, Mechanical properties, Physical properties, Production, Simulation, Specifications.

For abstract, see NSA 30 08, number 23435.

19F. Guns

AD-785 612/3GA PC$3.25/MF$2.25
Rock Island Arsenal Ill General Thomas J Rodman Lab
A MORE RATIONAL APPROACH TO THE STRESS ANALYSIS OF GUN TUBES,
Shih-Chi Chu. 1973, 16p

Descriptors: *Gun barrels, *Stresses, Stress strain relations, Finite difference theory, Thermal analysis, Loads(Forces), Mathematical models.

On the basis of the Prandlt-Reuss stress-strain rule, the von Mises flow criterion, and the strain-hardening and compressibility properties of a material, an incremental theory is proposed in this paper for solving the problem of elastoplastic thick-walled tubes subjected to both mechanical and transient thermal loadings. In the developed method, incremental stresses and strains are directly used as variables; hence, numerical differentiation in the evaluation of stresses and strains is not required. Moreover, since no assumption is made on the displacement field, this method can provide better results than those of the finite-element methods. Since the consideration of stress, strain, loading, and temperature history is involved in the analysis, the present theory is particularly suitable for predicting stress and strain distribution, and location of elastic-plastic boundaries of a thick-walled cylinder such as a gun tube subjected to nonproportionate mechanical and transient thermal loadings.

AD-785 701/4GA PC$3.25/MF$2.25
Rock Island Arsenal Ill General Thomas J Rodman Lab
UNSTEADY HEAT TRANSFER ANALYSIS FOR ANY AMMUNITION, GUN, AND FIRING SCHEDULE,
Rao V. S. Yalamanchili. 1973, 15p

Descriptors: *Heat transfer, *Ammunition propellants, *Guns, Thermochemistry, Compressible flow, Gun barrels, Convection(Heat transfer).

The propellant gas convective heat transfer problem is divided into several subproblems: Generation of thermochemical properties for any chosen propellant; analysis of transient, inviscid, compressible flow through the gun barrel; analysis of unsteady, viscous, compressible flow with arbitary pressure gradients on the bore surface; analysis of transient heat diffusion through single or multi-layer gun tubes; analysis of unsteady free convection and radiation around the gun tube; and control of a sequence of procedures due to the nature of unknown and transient boundary conditions and also due to coupling between the problems.

AD-785 704/8GA PC$5.25/MF$2.25
Rockwell International Corp Canoga Park Calif Rocketdyne Div
INVESTIGATION OF BACK-BLAST ATTENUATORS FOR RECOILLESS RIFLES.
Final rept.,
A. T. Sutor. Jun 74, 124p Rept no. R-9343 WVT-CR-74018
Contract DAAF07-73-C-0159

Descriptors: *Recoilless guns, *Gunships, *Helicopters, *Recoil mechanisms, Test methods, Blast, Gunmounts, External stores, Breech mechanisms, Modification, Gun propellants, Gas flow.
Identifiers: Design, Huey cobra.

Based on a series of water table tests, various configurations of recoilless rifle back blast suppressor models were designed and fabricated for shock tube experiments. Various lengths of suppressor were tested with enclosed cavities for damping the blast wave. Because the blast wave suppression was less then desired, a new series of mufflers, using commercial washers, was tested. Attenuations of 62 to 74 per cent were measured in the regions of peak blast wave pressure. A design concept based on the best suppressor design tested was incorporated into a layout drawing. This suppressor design consisted of a multinozzle plate and adapter which attaches to the Army 105 mm recoilless rifle. A recommended test procedure for the 105 mm recoilless rifle at Picatinny Arsenal included a series of tests at increasing chamber pressure. (Modified author abstract)

N74-30381/9GA PC$4.50/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
AUTOMATED FIREARMS IDENTIFICATION SYSTEM (AFIDS), PHASE 1.
R. J. Blackwell, and E. P. Framan. 1 Jul 74, 28p
NASA-CR-139371, JPL-SP-43-8
Contract NAS7-100

Descriptors: *Ammunition, *Guns (Ordnance), *Pattern recognition, Algorithms, Computerized simulation, Striation.

For abstract, see STAR 1219

PAT-APPL-483 736 PC$3.25/MF$2.25
Department of the Air Force Washington D C
GUN SUPPORT TUBE ASSEMBLY.
Patent application,
Ernest Fark. Filed 27 Jun 74, 11p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Gatling gun, *Gun barrels, *Supports, Patents, Gun barrel attachments, Gunfire, Vibration.
Identifiers: PAT-CL-89-12, *Patent applications.

The patent application relates to a gun support tube assembly adapted for use with a Gatling-type gun. The assembly includes: a plurality of barrel clamps which hold and guide the cluster of gun barrels; stationary bearing sleeves, with one of each of the sleeves surrounding a different one of the barrel clamps; and, a stationary gun support tube, to the internal surface of which each of the bearing sleeves is removably attached; the bearing sleeves, and the barrel clamps. When the cluster of gun barrels is rotated within the stationary gun support tube and the gun barrels are fired, gun barrels are prevented from whipping; and, thereby, the boresight accuracy of the Gatling-type gun is maintained.

19G. Rockets

N74-30301/7GA PC$6.00/MF$2.25
Saab-Scania, Linkoping (Sweden).
PAYLOAD S10.
Final Report.
11 Apr 74, 58p RRK-S10-74:52
Subm-Prepared for Swedish Space Corp. Misc-Original Contains Color Illustrations.

Descriptors: *Nike-tomahawk rocket vehicle, *Payloads, *Rocket sounding, Checkout, Engineering drawings, Experimental design, Instrument packages, Spin tests, Sweden, Telemetry.

For abstract, see STAR 1219

PAT-APPL-486 804 PC$3.25/MF$2.25
Department of the Air Force Washington D C
SPOOL FOR WIRE DEPLOYMENT.
Patent application,
J. R. Slatman. Filed 9 Jul 74, 9p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Sounding rockets, *Wire, Patents, Deployment, Electric discharges, Lightning.
Identifiers: PAT-CL-324-158-R, *Patent applications, *Spools.

The patent application relates to wire deployment, and, more particularly, to a spool for deploying wire from a high speed rocket. The body is made of a pair of sections separated by a first braking ring. A second braking ring is adjustably mounted on the body adjacent the first braking ring. In operation the wire passes through the braking rings and at a preselected time during the unwinding of the wire from the spool, the braking rings apply a braking force thereto thereby preventing any damage to the wire during the unwinding procedure.

20. PHYSICS

20A. Acoustics

AD-786 009/1GA PC$3.25/MF$2.25
Saclant ASW Research Centre La Spezia (Italy)
ACOUSTIC RAY-TRACING AND PROPAGATION-LOSS COMPUTATIONS ON A MINI-COMPUTER.
Memorandum rept.,
Martin Thompson, and John B. W. Padley. 1 Jul 74, 23p Rept no. SACLANTCEN-SM-49

Descriptors: *Acoustic velocity, *Ray tracing, *Minicomputers, *Computations, Underwater sound, Numerical analysis, Italy.

Details are given of the derivation of formulae for the solution of the wave equations on a mini-computer, using a linear segment approximation to the sound-speed profile. A method is described for calculating the total propagation loss, and a brief description of the computer program used is given. (Author)

AD-786 011/7GA PC$4.25/MF$2.25
Saclant ASW Research Centre La Spezia (Italy)
AN EXPERIMENTAL STUDY OF THE REFLECTION OF UNDERWATER SOUND FROM THE SEA SURFACE.
Technical memo.,
Willem Wijmans. 15 Aug 74, 59p Rept no. SACLANTCEN-SM-51

Descriptors: *Underwater sound, *Ocean surface, Underwater sound signals, Reflection, Scattering, Roughness, Explosive charges, Broadband, Hydrophones, Coherence, Theorems, Italy.
Identifiers: *Underwater sound transmission.

An experimental study of forward scattering of sound from a rough sea surface has been made using an explosive charge as a broadband sound source and a linear array of omnidirectional hydrophones as a receiver. Using the surface-grazing angle of the incident sound and the sea-surface roughness as parameters the signal coherence has been examined for a single hydrophone (temporal coherence) and for the signals from two hydrophones of the array (spatial coherence). A simple theory has been used to guide the analysis. The surface scattering is assumed to consist of a coherent part and an additional incoherent part such that the total average received power is conserved. This time-frequency theory describes the surface-scattering process sufficiently well to agree with the experimental results. (Author)

AD-786 013/3GA PC$3.25/MF$2.25
Saclant ASW Research Centre La Spezia (Italy)

DEVELOPMENT OF A THEORETICAL MODEL FOR SOUND PROPAGATION IN A DEEP, VARIABLE OCEAN.
Richard H. Clarke. 1 Sep 74, 23p Rept no. SACLANTCEN-SR-8

Descriptors: *Underwater sound, *Deep water, Sound transmission, Ray tracing, Acoustic velocity, Diffraction, Variations, Roughness, Sea water, Predictions, Sea states, Mathematical models, Internal waves, Anomalies, Italy, Underwater sound equipment.
Identifiers: *Underwater sound transmission.

The report describes the development of a 'philosophy' or method of approach to the problem of obtaining quantitative predictions of the fluctuating sound field as it propagates in a deep, variable ocean. By combining the use of ray tracing with statistical diffraction theory the method takes simultaneous account of the acoustic effects of the large-scale (mainly) vertical variations in soundspeed, the rough sea surface, internal waves, small-scale turbulent fluctuations in soundspeed, and arbitrary directivities of source and receiver.

N74-29378/8GA PC$4.00/MF$2.25
Cornell Univ., Ithaca, N.Y.
SONIC BOOM RESEARCH.
Final Technical Report, 1 Sep. 1967 - 31 Aug. 1974.
A. R. Seebass. Aug 74, 4p NASA-CR-138301
Contract NGL-33-010-054

Descriptors: *Acoustic velocity, *Aerodynamic noise, *Pressure gradients, *Sonic booms, Aerodynamic configurations, Meteorological parameters, Performance prediction.

For abstract, see STAR 1219

N74-29379/6GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SUPPRESSOR NOZZLE AND AIRFRAME NOISE MEASUREMENTS DURING FLYOVER OF A MODIFIED F106B AIRCRAFT WITH UNDERWING NACELLES.
R. R. Burley. 22 Nov 74, 34p NASA-TM-X-71578, E-8028
Conf-Proposed for Presentation at Winter Ann. Meeting of the AM. Soc. Of Mech. Engr., New York, 17-22 Nov. 1974.

Descriptors: *Acoustic measurements, *Aerodynamic noise, *Aircraft noise, *F-106 aircraft, Aerodynamic configurations, Flight tests, Nozzle flow, Sound propagation.

For abstract, see STAR 1219

N74-29383/8GA PC$12.00/MF$2.25
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
ACOUSTIC AND AERODYNAMIC TESTING OF A SCALE MODEL VARIABLE PITCH FAN.
R. R. Jutras, and S. B. Kazin. Mar 74, 176p NASA-CR-121232, R73AEG196
Contract NAS3-12430

Descriptors: *Aerodynamic noise, *Propeller fans, *Quiet engine program, *Turbofan engines, Acoustic properties, Blade tips, Noise reduction, Supersonic speeds.

For abstract, see STAR 1219

N74-29384/6GA PC$11.00/MF$2.25
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
ACOUSTIC RESULTS OF SUPERSONIC TIP SPEED FAN BLADE MODIFICATION.
R. R. Jutras, and S. B. Kazin. 1974, 160p NASA-CR-121233, R73AEG07
Contract NAS3-12430

Descriptors: *Aerodynamic noise, *Propeller fans, *Quiet engine program, *Turbofan engines, Acoustic properties, Blade tips, Noise reduction, Supersonic speeds.

For abstract, see STAR 1219

N74-29385/3GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
AERODYNAMIC AND ACOUSTIC PERFORMANCE OF EJECTORS FOR ENGINE-UNDER-THE-WING CONCEPTS.
U. Vonglahn, J. Goodykoontz, and D. Groesbeck. 1974, 47p NASA-TM-X-71587, E-8039
Conf-Presented at the Sixth Aircraft Design, Flight Test and Operations Meeting, Los Angeles, 12-14 Aug. 1974; Sponsored by the American Institute of Aeronautics and Astronautics.

Descriptors: *Aerodynamic noise, *Exhaust gases, *Nozzle flow, *Thrust augmentation, Aerodynamic configurations, Aircraft performance, Flight characteristics.

For abstract, see STAR 1219

N74-30120/1GA PC$12.75/MF$2.25
North Carolina State Univ., Raleigh. Center for Acoustical Studies.
A THEORETICAL AND EXPERIMENTAL STUDY OF WOOD PLANER NOISE AND ITS CONTROL.
J. S. Stewart. Aug 72, 195p NASA-CR-112314
Contract NGR-34-002-035

Descriptors: *Milling (Machining), *Noise reduction, *Planing, *Wood, Acoustic measurements, Cutters, Fourier transformation, Sound propagation, Vibration damping.

For abstract, see STAR 1219

N74-30423/9GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
FLYOVER NOISE CHARACTERISTICS OF A TILT-WING V/STOL AIRCRAFT (XC-142A).
R. J. Pegg, H. R. Henderson, and D. A. Hilton. Aug 74, 24p NASA-TM-X-3074, L-9037

Descriptors: *Acoustic measurements, *Aircraft noise, *Flight tests, *Xc-142 aircraft, Noise intensity, Propellers, Sound pressure, Sound propagation.

For abstract, see STAR 1220

N74-30428/8GA PC$24.00/MF$2.25
Douglas Aircraft Co., Inc., Long Beach, Calif.
PARAMETRIC STUDY OF STOL SHORT-HAUL TRANSPORT ENGINE CYCLES AND OPERATIONAL TECHNIQUES TO MINIMIZE COMMUNITY NOISE IMPACT.
Final Report.
Jun 74, 418p NASA-CR-114759, MDC-J4437
Contract NAS2-6994

Descriptors: *Acoustic measurements, *Aircraft noise, *Flight paths, *Noise reduction, *Short haul aircraft, Aerodynamic configurations, Externally blown flaps, Lift augmentation, Operations research.

For abstract, see STAR 1220

PATENT-3 827 288 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
DIGITAL SERVO CONTROL OF RANDOM SOUND TEST EXCITATION.
Patent.
R. B. Nakich. Patented 6 Aug 74, 14p PAT-APPL-235 338
Misc-Filed 16 Mar. 1972 Supersedes N72-25628 (10 - 16, p 2183). Subm-Sponsored by NASA.

Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Random noise, *Servocontrol, *Signal generators, Digital systems, Multiplexing, *Patents, Time sharing.
Identifiers: PAT-CL-73-69.

A digital servocontrol system for random noise excitation of a test object in a reverberant acoustic chamber employs a plurality of sensors spaced in the sound field to produce signals in separate channels which are decorrelated and averaged. The average signal is divided into a plurality of adjacent frequency bands cyclically sampled by a time division multiplex system, converted into digital form, and compared to a predetermined spectrum value stored in digital form. The results of the comparisons are used to control a time-shared up-down counter to develop gain control signals for the respective frequency bands in the spectrum of random sound energy picked up by the microphones.

PB-236 382/8GA PC$7.25/MF$2.25
Cambridge Collaborative, Inc., Mass.
NOISE CONTROL HANDBOOK FOR DIESEL-POWERED VEHICLES.
Interim rept. Oct 72-Mar 74,
R. J. Damkevala, J. E. Manning, and R. H. Lyon. May 74, 214p* DOT-TSC-OST-74-5
Contract DOT-TSC-587

Descriptors: *Noise pollution, *Handbooks, *Diesel engines, *Trucks, Noise reduction, Noise control, Noise abatement, Acoustic measurement, Acoustic insulation, Engine noise, Air filters, Mufflers, Exhaust systems, Cooling fans, Motor noise, Noise standards, Regulations, Power spectra.

The handbook has been prepared with the intention of assisting the truck fleet operator and the independent truck owner/operator in understanding and diagnosing noise problems and in selecting retrofittable components to lower truck exterior and interior noise levels. The handbook includes procedures for identifying and evaluating major truck noise sources, considerations for selection of acoustic materials, procedures for minimizing exhaust, intake and cooling fan noise, and methods for the minimization of in-cab noise levels. Appendixes give standard noise measurement procedures, muffler and intake filter selection data, cooling system design considerations and a list of known manufacturers of acoustic materials.

20B. Crystallography

AD-785 796/4GA Reprint
Northeastern Univ Boston Mass Dept of Physics
LATTICE DYNAMICS AND ANHARMONIC SELF-ENERGIES FOR THE LITHIUM HALIDES.
A. Rastogi, J. P. Hawranck, and R. P. Lowndes. 27 Jul 73, 15p AROD-10392.9-P
Grant DA-ARO-D-31-124-72-G125
Availability: Pub. in Physical Review B, v9 n4 p1938-1950, 15 Feb 74.

Descriptors: *Crystal lattices, Lithium compounds, Halides, Anharmonic oscillators, Phonons.
Identifiers: *Lithium halides, *Lattice dynamics, Lattice vibrations.

Lattice-dynamical calculations, using both the modified deformation-dipole model and the breathing-shell model, of the lithium halides are presented. Using the phonon frequencies and eigenvectors generated from these calculations, the frequency and temperature dependence of the Hermitean and anti-Hermitean parts of the $q = 0$ transverse-optic-mode self-energy are calculated. For all four materials the second-order cubic anharmonicity provides the dominant contribution to

the inverse lifetime at low temperatures, but as the temperature is increased the second-order quartic contribution becomes increasingly important and finally provides the dominant contribution. (Modified author abstract)

AD-786 251/9GA Reprint
Massachusetts Inst of Tech Lexington Lincoln Lab
CRYSTAL CHEMISTRY IN THE SYSTEM MSBO3,
H. Y-P. Hong, J. A. Kafalas, and J. B. Goodenough. 5 Jul 73, 8p
Sponsored in part by Department of the Air Force, Washington, D.C.
Availability: Pub. in Jnl. of Solid State Chemistry, v9 p345-351 1974.

Descriptors: *Antimonates, *Crystal structure, Potassium compounds, Lithium compounds, Sodium compounds, Rubidium compounds, Thallium compounds, Silver compounds, Energy levels, Bonding.
Identifiers: Rubidium antimonates, Potassium antimonates, Sodium antimonates, Lithium antimonates, Thallium antimonates, Silver antimonates, Cubic lattices.

Cubic, disordered phases of the compounds MSbO3(M = Li, Na, K, Rb, Tl, and Ag) have been investigated. The structures of NaSbO3 and AgSbO3, which have space group Im3, were solved by X-ray single-crystal analysis. The structures contain an essentially rigid SbO3 subarray consisting of pairs of edge-shared octahedra sharing common corners. Within this subarray, face-shared octahedra form <111> tunnels that intersect at the origin and body center of the unit cell, and the M(+) ions are randomly distributed over two positions within these tunnels. Several properties of these compounds are compared with the super ionic conductors M2O.11Al2O3 beta-alumina. (Modified author abstract)

AD-786 254/3GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
HARTREE-FOCK DIRECTIONAL COMPTON PROFILES FOR DIAMOND.
Journal article,
G. G. Wepfer, R. N. Euwema, G. T. Surratt, and D. L. Wilhite. 19 Oct 73, 6p Rept no. ARL-74-0097
Availability: Pub. in Physical Review B v9 n6 p2670-2673 15 Mar 74.

Descriptors: *Diamonds, Compton scattering, Hartree-Fock Approximation, Orientation(Direction).
Identifiers: *Compton profiles, Gaussian functions.

The electron Compton profiles for diamond have been calculated in the impulse approximation from two self-consistent crystalline Hartree-Fock momentum distributions in the (100), (111), (110), (112), and (221) directions. The two calculations use slightly different Gaussian basis sets. The results agree closely with experiment both in magnitude and in directional dependence. (Author)

ITF-74-4P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
NORMAL ELECTROMAGNETIC WAVES AND LIGHT PROPAGATION THROUGH A CRYSTAL.
A. S. Davydov, and E. N. Myasnikov. 1973, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Electromagnetic radiation, *Wave propagation), (*Visible radiation, Wave propagation), (*Crystals, Wave propagation), Energy absorption, Excitons.

For abstract, see NSA 30 08, number 23411.

JINR-P4-8017 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
INFLUENCE OF UNIAXIAL AND BIAXIAL ANISOTROPY ON THE MAGNETIC PROPERTIES OF THE SYSTEMS WITH BIQUADRATIC EXCHANGE.
B. Westwanski, and I. L. Buchbinder. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Crystals, *Magnetic properties), Anisotropy, Axial ratio, Crystal structure, Excitation, Order parameters.

For abstract, see NSA 30 08, number 23414.

JUL-1057-ZE PC$10.50/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Zentrallabor fuer Elektronik.
NEUTRON DIFFRACTION STUDIES OF NA SUB 2 S SUB 2 O SUB 6 .2 H SUB 2 O SINGLE-CRYSTALS ON A NEW ON-LINE OPERATED 4-CIRCLE-DIFFRACTOMETER.
K. Zwoll. Apr 74, 147p
In German. U.S. Sales Only.

Descriptors: (*Neutron diffractometers, *Design), (*Sodium sulfates, *Crystal structure), Camac system, Equipment interfaces, Monocrystals, Neutron diffraction, Programming.

For abstract, see NSA 30 08, number 23415.

N74-30204/3GA PC$7.25/MF$2.25
Technische Hochschule, Aachen (West Germany).
ORDERING STANDARDS FOR CUBIC FACE CENTERED MIXED CRYSTALS IN DIFFERENT MODELS ORDNUNGSEINSTELLUNGEN KUBISCH FLAECHENZENTRIERTER MISCHKRISTALLE IN VERSCHIEDENEN MODELLEN.
Ph.D. Thesis.
U. Gahn. 23 Jun 73, 83p
Language in German.

Descriptors: *Crystal structure, *Face centered cubic lattices, *Mathematical models, Chemical composition, Crystallography, Magnetic effects, Mixed crystals, Order-disorder transformations.

For abstract, see STAR 1219

N74-30211/8GA PC$10.75/MF$2.25
University of Southern Calif., Los Angeles. Chemical Engineering Dept.
ANALYTICS OF CRYSTAL GROWTH IN SPACE.
Annual Report, 5 Jun. 1973 - 4 Jun. 1974.
W. R. Wilcox, C. E. Chang, P. J. Shlichta, P. S. Chen, and C. K. Kim. 4 Jun 74, 152p NASA-CR-120314
Contract NAS8-29847

Descriptors: *Crystal growth, *Deep space, Computation, Crystals, Silicon, Spacecraft environments, Zone melting.

For abstract, see STAR 1219

20C. Electricity and Magnetism

COM-74-50856/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
DIELECTRIC CONSTANT AND LOSS.
Final rept.,
F. I. Mopsik. 1970, 24p
Pub. in Digest of Literature on Dielectrics, v32 ch3 p76-99 1970. (National Academy of Sciences, Washington, D.C.).

Descriptors: *Dielectric properties, Reviews.

The papers included are those abstracted during 1968 by Chemical Abstracts and Physics Abstracts and are those that are concerned with dielectric theory, either theoretical or experimental. The coverage of this chapter is a direct continuation of last year's chapter.

COM-74-50857/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ELECTRIC FIELD DISTRIBUTIONS AND SPACE CHARGE BEHAVIOR IN NITROBENZENE UNDER LOW FREQUENCY ALTERNATING VOLTAGE,
Robert E. Hebner, Jr., Esther C. Cassidy, Markus Zahn, and Richard J. Sojka. 1974, 8p
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Pub. in Proceedings of the 1973 Annual Conference on Electrical Insulation and Dielectric Phenomena, Varennes, Quebec, 29-31 Oct 73, p112-119 1974. (National Academy of Sciences, Washington, D.C.).

Descriptors: *Kerr electrooptical effect, *Dielectrics, *Nitrobenzenes, Liquids, Capacitors, Electric fields, Charge density.

The measurement of electric field distributions in dielectric liquids during high voltage operation is of interest for applications ranging from high voltage measurements to the physics and chemistry of dielectric fluids to the prediction and control of electrical breakdown in high-voltage apparatus. For this reason, the authors have used the electro-optic Kerr effect to measure the spatial and temporal variations of electric fields in a nitrobenzene-filled parallel-plate capacitor. Results obtained during operation under low frequency alternating high voltages are emphasized because of the significance of studies in this frequency range for design and testing of high-voltage apparatus. The results obtained are compared both with pulses and direct voltage observations in the same system and with some recent discussions of the role of particulate charge carriers in the behavior of insulating liquids.

ITF-74-49E PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
CLUSTER THEORY OF SPIN EXCITATIONS OF MIXED ANTIFERROMAGNETS. APPLICATION TO MN/SUB C/CO/SUB 1-C/F SUB 2 AND KMN/SUB C/CO/SUB 1-C/F SUB 3 .
I. P. Dzyub. 1974, 21p
U.S. Sales Only.

Descriptors: (*Manganese fluorides, *Spin waves), (*Cobalt fluorides, Spin waves), (*Potassium fluorides, Spin waves), Antiferromagnetic materials, Exchange interactions, Excitation, Scattering, Slow neutrons, Spin exchange, Variations.

For abstract, see NSA 30 08, number 23450.

ITF-74-65P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
CYLINDRICAL DOMAINS IN FERROMAGNETIC FILMS.
V. G. Bar'yakhtar, V. V. Gann, and Yu. I. Gorobets. 1974, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Ferromagnetic materials, *Domain structure), Cylinders, Films, Magnetic fields, Stability.

For abstract, see NSA 30 08, number 23412.

ITF-74-9E PC$5.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
THEORY OF TWO-EXCITON LIGHT ABSORPTION IN COLLINEAR ANTIFERRODIELECTRICS.
E. G. Petrov. 1974, 36p
U.S. Sales Only.

Descriptors: (*Antiferroelectric materials, *Optical properties), Absorption, Coulomb excitation, Dielectric materials, Energy spectra, Excitons, Green function, Interactions, Ion pairs, Magnetic dipole moments, Visible radiation.

For abstract, see NSA 30 08, number 23449.

JINR-P8-7663 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
SELECTION OF ELECTROINSULATING MATERIALS FOR CRYOGENIC AND SUPERCONDUCTING DEVICES AND STUDY OF THEIR PHYSICAL PROPERTIES.
N. G. Anishchenko, and E. Yavorskii. 1974, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Superconductors, *Dielectric materials), (*Cryogenics, Dielectric materials), Specific heat, Thermal conductivity.

For abstract, see NSA 30 08, number 22532.

LBL-1844 PC$9.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
LOW TEMPERATURE STUDIES. I. NEW ANTIFERROMAGNETIC RESONANCE EFFECTS IN THE IRON-GROUP FLUORIDES. II. IMPEDANCE MATCHING A JOSEPHSON-EFFECT GALVANOMETER BY MEANS OF A SUPERCONDUCTING TRANSFORMER.
W. E. Tennant. May 74, 119p
Contract W-7405-eng-48

Descriptors: (*Cobalt fluorides, *Antiferromagnetism), (*Manganese fluorides, Antiferromagnetism), (*Iron fluorides, Antiferromagnetism), (*Zinc fluorides, Antiferromagnetism), Far infrared radiation, Galvanometers, Resonance, Spectroscopy, Superconductors, Transformers.

For abstract, see NSA 30 08, number 22534.

LBL-2597 PC$9.75/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
JOSEPHSON JUNCTIONS AS MICROWAVE HETERODYNE DETECTORS.
Y. Taur. Apr 74, 133p
Contract W-7405-eng-48

Descriptors: (*Josephson junctions, *Performance), (*Microwave equipment, Josephson junctions), Ghz range, Squid, Ultralow temperature, Vanadium.

For abstract, see NSA 30 08, number 22535.

N74-30113/6GA PC$12.00/MF$2.25
Technische Universitaet, Hanover (West Germany).
ON THE ARC MOTION IN THE MAGNETIC FIELD OF CONTACT ARRAYS DURING INITIATION UEBER DIE LICHTBOGENBEWEGUNG IM MAGNETFELD VON KONTAKTANORDNUNGEN WAEHREND DES OEFFNUNGSVORGANGES.
Ph.D. Thesis.
U. Druecker. 1973, 178p
Language in German.

Descriptors: *Electric arcs, *Magnetic field configurations, *Magnetic induction, Arc discharges, Electric current, Photoelectric emission, Propagation velocity.

For abstract, see STAR 1219

N74-30199/5GA PC$12.00/MF$2.25
Bochum Univ. (West Germany).
TRANSFER BEHAVIOR OF SUPERCONDUCTING COILS WITH HIGH CURRENT DENSITY AND ELECTRONIC PROTECTIVE CIRCUITRY UEBERGANGSVERHALTEN VON SUPRALEITUNGSSPULEN MIT HOHER STROMDICHTE UND ELEKTRONISCHEN SCHUTZSCHALTUNGEN.
Ph.D. Thesis.
D. J. Hagedorn. 1973, 177p
Language in German.

Descriptors: *Electronic control, *Magnetic coils, *Superconductivity, Electrical resistance, High voltages, Phase transformations, Voltage regulators.

For abstract, see STAR 1219

N74-30207/6GA PC$6.75/MF$2.25
Electrotechnical Lab., Tokyo (Japan).
THEORETICAL AND EXPERIMENTAL STUDIES ON MAGNETIC INSTABILITY IN A HARD SUPERCONDUCTOR.
K. I. Koyama. Dec 73, 73p

Descriptors: *Electric fields, *Magnetic flux, *Superconductors, *Thermal conductivity, Current density, Magnetic diffusion, Mathematical models.

For abstract, see STAR 1219

N74-31152/3GA PC$8.75/MF$2.25
Ruhr Univ., Bochum (West Germany).
EFFECT OF THE TECHNOLOGICAL GRINDING PROCESS ON THE COERCITIVE FIELD OF (LANTHANIDE) CO5 PERMANENT MAGNETIC MATERIAL EFFEKT DES TECHNOLOGISCHEN MAHLPROZESSES AUF DAS KOERZITIVFELD VON (LANTHANID) CO5 DAUERMAGNETMATERIAL.
Ph.D. Thesis.
M. Paulus. 1973, 114p
Language in German.

Descriptors: *Magnetic properties, *Metal grinding, *Oxides, *Rare earth compounds, Chemical composition, Crystal defects, Plastic deformation, Stacking fault energy.

For abstract, see STAR 1220

N74-31355/2GA PC$8.50/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
A CONTRIBUTION FOR CALCULATING PLATES BY A POTENTIAL THEORETICAL ANALOG PROCEDURE EIN BEITRAG ZUR BERECHNUNG VON PLATTEN MIT HILFE EINES POTENTIALTHEORETISCHEN ANALOGIEVERFAHRENS.
Ph.D. Thesis.
P. Schwarz. 1973, 106p
Language in German.

Descriptors: *Elastic plates, *Electric potential, *Loads (Forces), *Mathematical models, Analogs, Computerized simulation, Load distribution (Forces), Matrices (Mathematics).

For abstract, see STAR 1220

20D. Fluid Mechanics

AD-785 605/7GA PC$3.25/MF$2.25
Army Air Mobility Research and Development Lab Moffett Field Calif Ames Directorate
NUMERICAL SIMULATION OF TRANSONIC FLOW ABOUT AIRPLANES AND HELICOPTER ROTORS.
W. F. Ballhaus, and F. X. Caradonna. 1973, 16p

Descriptors: *Aerodynamic control surfaces, *Transonic characteristics, Wings, Helicopter rotors, Performance(Engineering), Maneuverability, Shock waves, Flow separation, Mechanical engineering, Computerized simulation, Equations of motion, Costs, Flow fields, Research management.
Identifiers: *Rotor tip design, *Fixed wing aircraft.

Most modern aircraft achieve optimum cruise performance and maneuverability when flying at high subsonic Mach numbers in the transonic regime. As the Mach number increases beyond the optimum, the extent and strength of these shock waves increases, and performance deteriorates rapidly giving way to flow separation and buffet. Predictions of in-flight performance for new configurations are often unreliable. It seems to attempt to use numerical simulations to supplement wind tunnel tests whenever possible. This method is discussed. (Modified author abstract)

AD-785 728/7GA Reprint
Cincinnati Univ Ohio
FILM COOLING BY OBLIQUE SLOT INJECTION,
R. H. Nilson, and Y. G. Tsuei. 26 Dec 73, 4p
AROD-T-4.61-E
Contract DAHC04-69-C-0016
Revision of report dated 6 Nov 73.
Availability: Pub. in AIAA Jnl., v12 n5 p727-729, May 74.

Descriptors: *Fluid mechanics, *Film cooling, *Walls, *Compressible flow, Laminar boundary layer, Slots, Injection, Finite difference theory, Mathematical models.
Identifiers: Oblique injection, Single slots, Multiple slots.

Wall cooling by boundary-layer injection or transpiration is used in engineering applications. The present investigation concerns the film cooling effectiveness of oblique injection from the wall into a compressible laminar boundary layer through single or multiple slots. Numerical solutions of the boundary-layer equations are obtained by a satisfactory finite-difference method. Film cooling effectiveness is presented for a wide variety of injection configurations so that the effects of coolant mass flow, injection angle, boundary-layer thickness, slot width, and upstream cooling slots can be investigated. The results are discussed. (Modified author abstract)

AD-785 770/9GA Reprint
Cornell Univ Ithaca N Y Center for Applied Mathematics
EXPANSION FUNCTIONS WITH BOUNDARY-LAYER BEHAVIOR AND THE ORR-SOMMERFELD EQUATION,
G. S. S. Ludford, B. D. Hassard, and T. S. Chang. 1974, 17p AROD-5329.48-M
Grants DA-ARO-D-31-124-71-G163, NSF-GP-28483
Availability: Pub. in Jnl. of Mathematical Analysis and Applications, v46 n2 p463-477 May 74.

Descriptors: *Channel flow, Boundary layer, Reynolds number, Viscous flow, Navier Stokes equations.
Identifiers: Orr-Sommerfeld equation.

Much recent work has been devoted to the description of the onset of instability in plane parallel channel flow. The real problem is of course nonlinear; however, study of even the linear theory, the Orr-Sommerfeld equation, has been an extremely difficult task. Only recently have reliable accurate numerical calculations been performed, using the technique of orthogonal expansions. In this paper we introduce a new set of orthogonal functions whose novel feature is their dependence upon the Reynolds number.

AD-785 779/0GA Reprint
Michigan Univ Ann Arbor
A MODEL FOR LAMINAR BOUNDARY-LAYER FLOW NEAR A SEPARATION POINT,
A. F. Messiter, and R. L. Enlow. 1973, 18p
Contract DAHC04-68-C-0033
Availability: Pub. in SIAM Jnl. Applied Mathematics, v25 n4 p655-670 Dec 73.

Descriptors: *Laminar boundary layer, *Flow separation, *Blunt bodies, Mathematical models, Asymptotic series, Boundary layer flow, Interactions, Two dimensional flow.

Steady laminar boundary-layer flow near a separation point is investigated using asymptotic expansions of coordinate type, presumed to be valid as the distance from separation tends to zero. Two attempts at removing the contradiction in a solution given by Goldstein are outlined, and consideration of interaction with the external flow shows that each eventually again leads to an inconsistency. Next an attempt is made to determine whether or not a free-streamline theory for the external flow might permit the formulation of an analogous boundary-layer problem which does possess a self-consistent solution. It is shown that an upstream solution similar in character to Goldstein's can be constructed without any apparent contradiction. Possibilities for extension of the solution are considered. (Modified author abstract)

AD-785 786/5GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
BASE PRESSURE IN LAMINAR SUPERSONIC FLOW,
A. F. Messiter, G. R. Hough, and A. Feo. 14 Sep 72, 22p AROD-7324.4-E
Contract DAHC04-68-C-0033
Prepared in cooperation with National Aeronautics and Space Administration, Moffett Field, Calif. Ames Research Center, and Instituto Nacional de Tecnica Aeroespacial, Madrid (Spain).
Availability: Pub. in Jnl. of Fluid Mechanics, v60 pt3 p605-624 1973.

Descriptors: *Wedges, *Supersonic characteristics, *Laminar flow, *Base pressure, Mathematical models, Asymptotic series, Reynolds number, Walls, Adiabatic gas flow, Boundary layer flow, Inviscid flow, Approximation(Mathematics), Thermal properties.
Identifiers: *Backward facing steps.

An asymptotic description is proposed for supersonic laminar flow over a wedge or a backward-facing step, for large Reynolds number and for a base or step height which is small compared with the boundary-layer length. The analysis is carried out for adiabatic wall conditions and a viscosity coefficient proportional to temperature. A result is based on an inviscid-flow approximation for the corner expansion and for reattachment, with viscous forces important primarily in a thin sublayer about the dividing streamline. A prediction of the pressure distribution at reattachment is given and the result is compared with experimental pressure distributions. (Modified author abstract)

AD-785 803/8GA Reprint
Mississippi State Univ State College Dept of Aerophysics and Aerospace Engineering
UNIQUENESS OF MEAN TURBULENT FLOWS,
Z. U. A. Warsi. 7 May 73, 5p AROD-T-3.28-E
Contract DAHC04-68-C-0003
Availability: Pub. in The Physics of Fluids, v17 n1 p34-36 Jan 74.

Descriptors: *Turbulent flow, *Equations of motion, *Fluid dynamics, Navier Stokes equations, Closures, Vector analysis, Problem solving, Nonuniform flow, State state, Hilbert space, Velocity.
Identifiers: Velocity fields.

In the closure problem of the theory of turbulent mean flows, the unknown correlations have to be expressed in terms of the other field variables. Estimates for the behavior of the unknowns, both for the steady and nonsteady flows, have been obtained which insure uniqueness of solutions. (Author)

AD-785 808/7GA Reprint
Cincinnati Univ Ohio Dept of Aerospace Engineering
SOME EFFECTS CAUSED BY SOLID PARTICLES IN FLOWS,
A. Hamed, and W. Tabakoff. 26 Nov 73, 5p
AROD-T-4.62-E
Contract DAHC04-69-C-0016
Revision of report dated 15 Aug 73. Presented at the AIAA Fluid and Plasma Dynamics Conference, (6th). Held at Palm Springs, Calif. 16-18 Jul 73, Paper 73-687.
Availability: Pub. in AIAA Jnl., v12 n2 p581-582 May 74.

Descriptors: *Two phase flow, *Gas dynamics, *Particles, Flow fields, Equations of motion, Tensor analysis, Stresses, Angular momentum, Mathematical models.
Identifiers: *Particulated gas flow.

The equations of conservation of angular momentum of the two phases of a particulate flow are derived, and the stress tensor determined. It was found to consist of antisymmetric elements in addition to the pressure and symmetric shear stresses in nonparticulate flows. The particulate flow properties are determined numerically throughout the flowfield from frozen to equilibrium regimes. (Author)

AD-785 810/3GA Reprint
Polytechnic Inst of Brooklyn N Y
AXISYMMETRIC POTENTIAL FLOW SEPARATION AT A SHARP TRAILING EDGE,
R. C. Ackerberg. 18 Jul 73, 13p AROD-6152.19-E
Grant DA-ARO-D-31-124-73-G91
Availability: Pub. in Studies in Applied Mathematics, v52 n4 p377-387 Dec 73.

Descriptors: *Flow separation, *Sharp bodies, *Trailing edge, Axially symmetric flow, Problem solving, Asymptotic series, Boundary layer flow, Viscous flow, Pressure gradients, Walls, Partial differential equations, Free field.
Identifiers: Potential flow.

The paper is concerned with obtaining a formal asymptotic solution for the axisymmetric potential flow which occurs in the neighborhood of a sharp trailing edge at which a free streamline is attached. This flow is of interest because the nature of the viscous boundary-layer separation that occurs at the separation point depends on the potential flow pressure gradient along the wall upstream of the separation point. (Author)

AD-785 853/3GA PC$4.75/MF$2.25
Naval Postgraduate School Monterey Calif
PERIODIC FLOW ABOUT BLUFF BODIES. PART 1. FORCES ON CYLINDERS AND SPHERES IN A SINUSOIDALLY OSCILLATING FLUID.
Technical rept. Sep 73-74,
Turgut Sarpkaya, and Olcay Tuter. Sep 74, 90p
Rept no. NPS-59SL74091
Sponsored by National Science Foundation, Washington, D.C.

Descriptors: *Blunt bodies, *Water flow, *Oscillation, Cylinders, Spheres, Periodic variations, Hydrodynamics, Force(Mechanics), Water tunnels, Test methods, Vertical orientation, Drag, Inertia, Lift, Coefficients, Model tests.
Identifiers: Periodic flow.

The in-line and transverse forces acting on cylinders and the in-line force acting on spheres placed in a sinusoidally oscillating fluid have been measured. The periodic flow was generated in a U-shaped vertical water channel through the use of a pneumatic oscillator. The drag, inertia and the lift coefficients as well as the total force coefficient have been determined through the use of Fourier analysis and found to depend on a period parameter. (Modified author abstract)

AD-785 927/5GA PC$3.75/MF$2.25
Washington Univ Seattle
NUMERICAL STREAM LINE APPROACH TO FREE SURFACE PROBLEMS,
Carl E. Pearson. 31 Dec 73, 27p
Contract N00014-67-A-0103-0028

Descriptors: *Inviscid flow, *Incompressible flow, *Iterations, Equations of motion, Potential theory, Steady state, Numerical analysis.
Identifiers: *Streamlining, Hodographs.

A numerical method, based on the iteration of stream line positions, is described for incompressible inviscid (but not necessarily irrotational) steady flow with a free surface. The method is accurate and efficient, and appears susceptible of generalization. (Author)

AD-786 194/1GA Reprint
Cornell Univ Ithaca N Y Dept of Theoretical and Applied Mechanics
STAGNATION-POINT FLOW IN A ROTATING FLUID,
R. W. Davis, and G. S. S. Ludford. 16 Jul 73, 7p
AROD-5329.53-M
Grants DA-ARO-D-31-124-71-G163, NSF-GP-28483
Availability: Pub. in Physics of Fluids, v17 n2 p275-279 Feb 74.

Descriptors: *Fluid flow, *Vortices, *Stagnation point, Boundary value problems, Navier Stokes equations, Boundary layer.
Identifiers: *Rotating fluids.

The exact solution of the Navier-Stokes equations originated by von Karman is shown to apply even when a stagnation-point flow is added. The numerical integration is carried through in five special cases, chosen for their relevance to previous work of Homann, of Hannah, and of Benton as well as the 'coffee-tin experiment' which started the investigation. (Author)

AD-786 223/8GA PC$4.75/MF$2.25
West Virginia Univ Morgantown Dept of Aerospace Engineering
LAMINAR SEPARATED FLOW OVER NON-LIFTING ELLIPSES.
Technical rept.,
Nathan Ness, Yang-Tai Thomas Lin, and Hsin-Fuh Wang. Jul 74, 77p Rept no. TR-41
Contract N00014-68-A-0512

Descriptors: *Elipses, *Laminar flow, Flow fields, Boundary layer flow, Flow separation, Inviscid flow, Viscous flow, Computer programs.
Identifiers: *Ellipses.

A theory is presented for the laminar separated flow over nonlifting ellipses as a function of thickness/chord ratio (t/c) and free stream Reynolds number. The theory includes the separated flow over a circular cylinder as the special case when (t/c) = 1. The theory involves a coupling of inviscid and viscous flow through a search method. The inviscid analysis provides the pressure which is used in the boundary layer program to locate the boundary layer separation points. Convergence occurs when the boundary layer separation points are equal to the assumed inviscid separation points. (Modified author abstract)

AD-786 256/8GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
NUMERICAL ANALYSIS OF EDDY VISCOSITY MODELS IN SUPERSONIC TURBULENT BOUNDARY LAYERS.
Journal article,
J. S. Shang, W. L. Hankey, Jr., and D. L. Dwoyer. 5 Jul 73, 9p Rept no. ARL-74-0044
Revision of report dated 12 Feb 73. Presented at the AIAA Aerospace Sciences Meeting (11th) Held at Washington, D.C. on January 10-12, 1973, AIAA Paper 73-164.
Availability: Pub. in AIAA Jnl. v11 n12 p1677-1683 Dec 73.

Descriptors: *Flat plate models, *Viscous flow, Boundary layer, Heat transfer, Convection(Heat transfer), Turbulence, Wake.

Three multilayer eddy viscosity models by Herring-Mellor, Cebeci-Smith-Mosinskis, and Maise-McDonald are compared in this investigation. The aforementioned models were incorporated into an implicit finite difference numerical scheme for compressible turbulent boundary layers. Calculations were performed over Mach number ranges of approximately 0 to 4.55 with the Reynolds number spanning the range of 4 x 1,000,000 to 1.41 x 1,000,000,000 for zero pressure gradient and adiabatic wall. All selected viscosity models produced comparable results and provided excellent agreement with the experimental measurements. The calculated results revealed the dominant nature of the viscous sublayer while modifications in the law of the wake region exhibited a relatively mild influence on the numerical solutions. (Author)

AD-786 281/6GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
CONTINUOUS AND DISCONTINUOUS SOLUTIONS FOR OPTIMUM THRUST NOZZLES OF GIVEN LENGTH.
Journal article,
K. G. Guderley, D. Tabak, M. C. Breiter, and O. P. Bhutani. 1973, 44p Rept no. ARL-74-0033
Availability: Pub. in Jnl. of Optimization Theory and Applications, v12 n6 p588-628 Dec 73.

Descriptors: *Supersonic nozzles, *Flow fields, Thrust, Partial differential equations, Numerical analysis, Optimization.

This paper presents the theory and some numerical results about the optimization of thrust nozzles of prescribed length in a flow with swirl.

LA-5547-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
INVARIANT DECOMPOSITION OF THE EQUATIONS GOVERNING HYDRODYNAMIC FLOW AND THERMAL CONDUCTIVITY.
J. Nachamkin. Apr 74, 3p
Contract W-7405-eng-36

Descriptors: (*Hydrodynamics, *Equations), (*Thermal conductivity, Equations), Angular momentum, Entropy, Fluid flow, Invariance principles, Mathematics, Spectra, Spherical harmonics, Three-dimensional calculations, Vortices.

For abstract, see NSA 30 08, number 23461.

NP-20071 PC$15.50/MF$2.25
Technische Univ. Berlin (F.R. Germany). Inst. fuer Kerntechnik.
ANALYSIS OF STEADY-STATE FORCED CONVECTIVE TURBULENT HEAT TRANSFER IN CONCENTRIC ANNULI WITH ARBITRARILY VARYING BOUNDARY CONDITIONS OF SECOND KIND.
D. Gaertner. Apr 74, 247p
In German. U.S. Sales Only.

Descriptors: (*Turbulent flow, *Annular space), (*Forced convection, Turbulent flow), Data, Incompressible flow, Numerical solution, Nusselt number, Prandtl number, Reynolds number, Temperature distribution.

For abstract, see NSA 30 08, number 20980.

N74-29640/1GA PC$4.50/MF$2.25
National Physical Lab., Teddington (England). Div. of Maritime Science.
ON THE STABILITY OF BOUNDARY LAYERS.
M. Gaster. May 74, 29p NPL-MAR-SCI-TN-102

Descriptors: *Boundary layer stability, *Reynolds number, Parallel flow, Wave amplification.

For abstract, see STAR 1219

N74-29641/9GA PC$5.00/MF$2.25
Swedish State Shipbuilding Experimental Tank, Goteborg.
ON THRESHOLD PRESSURES FOR THE ONSET OF BUBBLE GROWTH.
B. Persson. 1974, 39p REPT-71
Conf-Presented at the Asme Winter Ann. Meeting, N. V., Nov. 1972.

Descriptors: *Bubbles, *Gas flow, *Incompressible fluids, *Thermodynamic properties, Cavitation flow, Pressure measurements, Temperature effects.

For abstract, see STAR 1219

N74-29642/7GA PC$4.50/MF$2.25
Weapons Research Establishment, Salisbury (Australia).
THE PREDICTION OF INFLEXIONAL VELOCITY PROFILES AND BREAKDOWN IN BOUNDARY LAYER TRANSITION.
K. D. Thomson. Oct 73, 30p WRE-1052(WR/D)

Descriptors: *Boundary layer transition, *Turbulent boundary layer, *Vortices, Bubbles, Flow characteristics, Hydrogen, Surface properties.

For abstract, see STAR 1219

N74-29643/5GA PC$8.75/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
ON THE INSTABILITY OF A TRANSLATING GAS BUBBLE UNDER THE INFLUENCE OF A PRESSURE STEP.
W. A. H. J. Hermans. 15 Jun 73, 115p

Descriptors: *Bubbles, *Flow characteristics, *Fluid flow, *Incompressible fluids, Flow equations, Mathematical models, Numerical analysis, Test facilities.

For abstract, see STAR 1219

N74-29644/3GA PC$10.25/MF$2.25
Technische Universitaet, Hanover (West Germany).
A COMPUTATION PROCEDURE FOR STATIONARY AND NONSTEADY TRANSONIC FLOWS AROUND SLENDER PROFILES EIN BERECHNUNGSVERFAHREN FUER STATIONAERE UND INSTATIONAERE SCHALLNAHE STROEMUNGEN UM SCHLANKE PROFILE.
Ph.D. Thesis.
K. H. Oehmen. 1973, 142p
Language in German.

Descriptors: *Approximation, *Slender wings, *Transonic flow, Flow distribution, Oscillations, Profiles, Steady flow, Unsteady flow.

For abstract, see STAR 1219

N74-29645/0GA PC$12.50/MF$2.25
Pennsylvania State Univ., University Park. Dept. of Aerospace Engineering.
ANALYTICAL AND EXPERIMENTAL STUDY OF MEAN FLOW AND TURBULENCE CHARACTERISTICS INSIDE THE PASSAGES OF AN AXIAL FLOW INDUCER.
Technical Report, Sep. 1972 - Jul. 1973.
C. A. Gorton, and B. Lakshminarayana. Sep 74, 187p NASA-CR-134682, PSU-AERSP-74-2
Contract NGL-39-009-007

Descriptors: *Axial flow, *Intake systems, *Turbulent flow, Equations of motion, Flow coefficients, Velocity.

For abstract, see STAR 1219

N74-29646/8GA PC$4.25/MF$2.25
Defence Standards Labs., Maribyrnong (Australia).
AN EXPERIMENTAL STUDY OF THE FLOW IN AN IMPINGEMENT JET.
D. B. Prowse. May 74, 24p REPT-587

Descriptors: *Air flow, *Flow characteristics, *Jet impingement, *Nozzle flow, Interferometry, Mach-zehnder interferometers, Test equipment, Thermocouples.

For abstract, see STAR 1219

N74-29647/6GA PC$4.00/MF$2.25
Iowa State Univ. of Science and Technology, Ames. Dept. of Aerospace Engineering.
NUMERICAL COMPUTATION OF TWO-DIMENSIONAL VISCOUS BLUNT BODY FLOWS WITH AN IMPINGING SHOCK.
Semiannual Progress Report, Dec. - Jun. 1974.
J. C. Tannehill. Jun 74, 12p NASA-CR-138308
Contract NGR-16-002-038

Descriptors: *Blunt bodies, *Finite difference theory, *Flow distribution, *Impingement, Time dependence, Two dimensional flow, Viscous flow.

For abstract, see STAR 1219

N74-29648/4GA PC$4.50/MF$2.25
Washington Univ., Seattle. Dept. of Mechanical Engineering.
SHOCK-INDUCED SEPARATION OF ADIABATIC TURBULENT BOUNDARY LAYERS IN SUPERSONIC AXIALLY SYMMETRIC INTERNAL FLOW.
R. J. Page, and M. E. Childs. 1974, 26p NASA-CR-138303
Contract NGR-48-002-047

Descriptors: *Shock waves, *Supersonic flow, *Turbulent boundary layer, *Wall flow, Engine inlets, Flow, Flow characteristics, Flow distribution.

For abstract, see STAR 1219

N74-29649/2GA PC$4.00/MF$2.25
Washington Univ., Seattle. Dept. of Mechanical Engineering.
CALCULATION OF TURBULENT SHEAR STRESS IN SUPERSONIC BOUNDARY LAYER FLOWS.
C. C. Sun, and M. E. Childs. 1974, 15p NASA-CR-138302
Contract NGR-48-002-047

Descriptors: *Flow characteristics, *Flow equations, *Shear stress, *Turbulent boundary layer, Data acquisition, Hot-wire anemometers, Laser doppler velocimeters, Numerical analysis.

For abstract, see STAR 1219

N74-29650/0GA PC$4.00/MF$2.25
Washington Univ., Seattle. Dept. of Mechanical Engineering.
MEAN AND FLUCTUATING FLOW MEASUREMENTS IN AXISYMMETRIC SUPERSONIC BOUNDARY LAYER FLOW SUBJECTED TO DISTRIBUTED ADVERSE PRESSURE GRADIENTS.
E. Gootzait, and M. E. Childs. 1974, 16p NASA-CR-139435
Contract NGR-48-002-047

Descriptors: *Boundary layer flow, *Flow characteristics, *Pressure gradients, *Turbulent boundary layer, Flow measurement, Inlet flow, Supersonic flow, Wind tunnel tests.

For abstract, see STAR 1219

N74-29651/8GA PC$4.00/MF$2.25
National Aerospace Lab., Tokyo (Japan).

METHODS OF DETECTING BOUNDARY LAYER TRANSITION.
N. Kawai, and Y. Oguni. 1973, 19p NAL-TR-353
In Japanese; English Summary.

Descriptors: *Boundary layer transition, *Transonic wind tunnels, Electric current, Liquid crystals, Noise (Sound), Thermistors.

For abstract, see STAR 1219

N74-29653/4GA PC$13.50/MF$2.25
Stanford Univ., Calif. Thermosciences Div.
THREE DIMENSIONAL TURBULENT BOUNDARY LAYERS: DATA SETS FOR TWO-SPACE COORDINATE FLOWS.
A. J. Wheeler, and J. P. Johnson. Aug 72, 207p
NASA-CR-138962, SU-MD-32
Contract NGL-05-020-420

Descriptors: *Statistical analysis, *Three dimensional boundary layer, *Turbulent boundary layer, Data reduction, Pressure gradients, Shear stress, Tables (Data).

For abstract, see STAR 1219

N74-29654/2GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANALYSIS OF SOUND PROPAGATION IN DUCTS USING THE WAVE ENVELOPE CONCEPT.
K. J. Baumeister. Jul 74, 40p NASA-TN-D-7719, E-7941

Descriptors: *Finite difference theory, *Noise (Sound), *Sound propagation, Boundary layers, Sound waves, Steady flow, Two dimensional bodies, Wave equations.

For abstract, see STAR 1219

N74-29655/9GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EXPERIMENTAL AND ANALYTICAL SONIC NOZZLE DISCHARGE COEFFICIENTS FOR REYNOLDS NUMBERS UP TO 8 X 10 TO THE 6TH POWER.
A. J. Szaniszlo. 1974, 15p NASA-TM-X-71595, E-8053
Conf-Proposed for Presentation at the Winter Ann. Meeting of the AM. Soc. Of Mech. Engr., New York, 17-22 Nov. 1974.

Descriptors: *Discharge coefficient, *Reynolds number, *Sonic nozzles, Gas flow, High pressure, Nitrogen, Nozzle geometry.

For abstract, see STAR 1219

N74-29928/0GA PC$4.50/MF$2.25
National Aerospace Lab., Tokyo (Japan).
AN EXPERIMENTAL INVESTIGATION OF FLAT-PLATE HELICAL INDUCERS FOR ROCKET TURBOPUMPS.
K. Kamijo, and A. Suzuki. 1973, 29p NAL-TR-345
In Japanese; English Summary.

Descriptors: *Cavitation flow, *Flat plates, *Leading edges, *Turbine pumps, Flow distribution, Three dimensional flow.

For abstract, see STAR 1219

N74-30050/0GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TORNADOLIKE GRAVITY-DRIVEN VORTEX MODEL.
R. G. Deissler, and D. R. Boldman. Aug 74, 21p
NASA-TN-D-7738, E-7917

Descriptors: *Gravitational effects, *Mesometeorology, *Tornadoes, *Vortices, Acceleration (Physics), Boundary layers, Condensation, Fluid flow, Gas streams, Liquid nitrogen, Models.

For abstract, see STAR 1219

N74-30368/6GA PC$6.75/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
STUDIES OF HEAT SOURCE DRIVEN NATURAL CONVECTION.
F. A. Kulacki, M. E. Nagle, and P. Cassen. Jul 74, 74p NASA-TM-X-70232, TR-3746-1
Contracts NGR-36-008-205, RF PROJ. 3746
Subm-Prepared by Ohio State Univ. Res. Found.

Descriptors: *Convective flow, *Fluid flow, *Heat transfer, *Thermodynamic properties, Isothermal processes, Temperature distribution, Temperature profiles.

For abstract, see STAR 1219

N74-30417/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
LONGITUDINAL AERODYNAMIC PERFORMANCE OF A SERIES OF POWER-LAW AND MINIMUM WAVE DRAG BODIES AT MACH 6 AND SEVERAL REYNOLDS NUMBERS.
G. C. Ashby, Jr.. Aug 74, 27p NASA-TM-X-2713, L-7609

Descriptors: *Aerodynamic coefficients, *Hypersonic flow, *Streamlined bodies, *Symmetrical bodies, Aerodynamic drag, Lift drag ratio, Numerical analysis, Wind tunnel tests.

For abstract, see STAR 1220

N74-30621/8GA PC$7.00/MF$2.25
California Univ., Los Angeles. School of Engineering and Applied Science.
TRANSONIC CONICAL FLOW.
K. G. Agopian. Feb 74, 77p NASA-CR-139564, UCLA-ENG-7382
Subm-Sponsored by NASA and Onr.

Descriptors: *Conical flow, *Flow theory, *Inviscid flow, *Shock waves, *Transonic flow, Aerodynamic characteristics, Aerodynamic coefficients, Pressure distribution, Slender wings.

For abstract, see STAR 1220

N74-30622/6GA PC$9.25/MF$2.25
Erlangen-Nuremberg Univ. (West Germany).
SINGLE PARTICLE MOTIONS IN NONSTEADY FLOW FIELD BEWEGUNG EINZELNER PARTIKELN IM INSTATIONAEREN STROEMUNGSFELD.
Ph.D. Thesis.
P. R. Schoeneborn. 1973, 121p
Language in German.

Descriptors: *Particle motion, *Spheres, *Unsteady flow, Approximation, Equations of motion, Flow distribution, Flow resistance.

For abstract, see STAR 1220

N74-30624/2GA PC$8.00/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
EXTERNAL SOUND FIELD EFFECT ON A TURBULENT LAYER.
P. Gougat. Jul 74, 96p NASA-TT-F-15852
Contract NASW-2481
Tran-Transl. Into English of "Influence d'UN Champ Acoustique Exterieur sur Une Couche Limite Turbulente" Cnrs, Meudon, France, Lab. D'Aerothermique, Rept. 70-8, Sep. 1970 51 p.

Descriptors: *Sound fields, *Turbulent boundary layer, Harmonic oscillation, Heat exchangers, Hot-wire anemometers, Wheatstone bridges, Wind tunnel tests.

For abstract, see STAR 1220

N74-30625/9GA PC$4.25/MF$2.25
Michigan State Univ., East Lansing. Div. of Engineering Research.
THE USE OF DIGITAL TECHNIQUES TO EXAMINE THE INTERMITTENT REGION OF A TURBULENT JET.
J. F. Foss, and T. E. Merrow. 15 Aug 74, 25p
NASA-CR-139396
Contract NGR-23-004-091

Descriptors: *Digital systems, *Turbulent jets, Clumps, Electric potential, Energy dissipation, Signal transmission.

For abstract, see STAR 1220

N74-30626/7GA PC$11.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ONE-DIMENSIONAL SHOCK WAVE FORMATION BY AN ACCELERATING PISTON.
Ph.D. Thesis - Ohio State Univ.
M. J. Mann. 1970, 164p NASA-TM-X-70292

Descriptors: *Acceleration (Physics), *Pistons, *Shock waves, Entropy, Gas pressure, Pressure measurements, Temperature gradients, Velocity measurement.

For abstract, see STAR 1220

N74-30628/3GA PC$4.00/MF$2.25
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
QUANTIZED VORTICES AROUND WAVEFRONT NODES, 2.
J. O. Hirschfelder, C. J. Goebel, and L. W. Bruch. 19 Jul 74, 12p NASA-CR-139530, WIS-TCI-515
Subm-Sponsored by NASA.

Descriptors: *Flow characteristics, *Time functions, *Vortices, *Waveforms, Flow equations, Flow visualization, Molecular collisions, Numerical analysis.

For abstract, see STAR 1220

N74-30629/1GA PC$4.50/MF$2.25
Cornell Univ., Ithaca, N.Y.
IMPROVEMENTS TO EMBEDDED SHOCK WAVE CALCULATIONS FOR TRANSONIC FLOW-APPLICATIONS TO WAVE DRAG AND PRESSURE RISE PREDICTIONS.
Annual Progress Report.
A. R. Seebass. Aug 74, 27p NASA-CR-139487
Contract NGR-33-010-057

Descriptors: *Drag, *Nonlinear equations, *Problem solving, *Transonic flow, Boundary layers, Numerical analysis, Shock discontinuity.

For abstract, see STAR 1220

N74-30630/9GA PC$5.75/MF$2.25
Texas Univ., Austin. Dept. of Aerospace Engineering and Engineering Mechanics.
AN EXPERIMENTAL INVESTIGATION OF THE FLOW FIELD FOR DOUBLE-WEDGE CONFIGURATIONS IN A MACH 4.97 STREAM.
J. J. Bertin, and J. C. Hinkle. Jun 74, 53p NASA-CR-134386, REPT-74003
Contract NAS9-13680

Descriptors: *Flow distribution, *Supersonic flow, *Wedges, Leading edges, Perturbation, Space shuttles, Viscosity.

For abstract, see STAR 1220

N74-30631/7GA PC$14.00/MF$2.25
Old Dominion Univ. Research Foundation, Norfolk, Va. School of Engineering.
AN EXPERIMENTAL AND THEORETICAL STUDY OF THE FLOW PHENOMENA WITHIN A VORTEX SINK RATE SENSOR.
Final Technical Report.
G. L. Goglia, and D. K. Patel. Jun 74, 221p NASA-CR-139648, TR-74-T2
Contract NGL-47-003-007

Descriptors: *Flow characteristics, *Flow equations, *Fluid flow, *Test equipment, *Vortices, Equipment specifications, Flow distribution, Flow velocity, Test equipment.

For abstract, see STAR 1220

N74-31038/4GA PC$7.25/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
THE APPROXIMATIVE SOLUTIONS FOR MIXED BOUNDARY VALUE PROBLEMS IN QUASILINEAR ELLIPTICAL DIFFERENTIAL EQUATIONS DIE APPROXIMATION DER LOESUNGEN GEMISCHTER RANDWERT-PROBLEME QUASILINEARER ELLIPTISCHER DIFFERENTIALGLEICHUNGEN.
Ph.D. Thesis.
H. D. Mittelmann. 1973, 81p
Language in German.

Descriptors: *Boundary value problems, *Flow characteristics, *Flow equations, *Fluid flow, Applications of mathematics, Integral equations, Matrices (Mathematics).

For abstract, see STAR 1220

N74-31332/1GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE CAPABILITY OF LASER-POWERED LAUNCH VEHICLES USING VERTICAL ASCENT TRAJECTORIES.
O. F. Spurlock. Aug 74, 19p NASA-TM-X-3085, E-7929

Descriptors: *Ascent trajectories, *Laser outputs, *Launch vehicles, *Propulsive efficiency, *Space missions, Payloads, Spacecraft performance, Specific impulse, Trajectory analysis.

For abstract, see STAR 1220

PB-235 998/2GA PC$4.25/MF$2.25
Illinois Univ., Urbana. Dept. of Computer Science.
TRANSIENT VISCOUS FLOW AROUND AN ELLIPTIC CYLINDER.
Master's thesis,
Gary Arthur Roediger. Jul 74, 52p UIUCDCS-R-74-670

Descriptors: *Viscous flow, *Cylinders, *Flow distribution, Gas dynamics, Navier Stokes equations, Compressible flow, Problem solving, Computer programming, Time dependence, Theses.
Identifiers: *Elliptic cylinders, *Flow fields, Transient flow.

The paper presents a study of the transient flow of a compressible viscous gas around an elliptic cylinder which smoothly accelerates to a fixed velocity. The complete time-dependent Navier-Stokes equations are solved numerically in the body reference frame using a non-orthogonal time-dependent curvilinear coordinate system designed to describe the body exactly and to resolve the important features of the transient flow. The computation is performed in a fixed mesh which maps into a grid in physical space which evolves to accommodate the transient flow.

UJV-3153-R PC$6.50/MF$2.25
Ustav Jaderneho Vyzkumu, Rez (Czechoslovakia).
EXPERIMENTAL RESEARCH OF LOCAL HYDRODYNAMIC CONDITIONS IN FLAT CHANNELS WITH LONGITUDINAL FINS. II.
J. Malak, J. Hejna, J. Cervenka, and F. Mantlik.
Feb 74, 68p
In Czech. U.S. Sales Only.

Descriptors: (*Turbulent flow, *Hydrodynamics), Shear, Stresses, Velocity.

For abstract, see NSA 30 08, number 20985.

20E. Masers and Lasers

AD-785 596/8GA PC$3.75/MF$2.25
Ilc Technology Inc Sunnyvale Calif
PRODUCTION ENGINEERING MEASURE FOR OPTICAL PUMPS FOR LASERS.
Quarterly rept. no. 2, Oct-Dec 73,
Hal Sowers, and Robert Maynard. 1 Feb 74, 29p
Rept no. R-ILC-73-22/Q2
Contract DAAB05-73-C-2078

Descriptors: *Optical pumping, *Flash lamps, *Lasers, Fabrication, Test equipment.
Identifiers: Design.

This program is directed towards establishing a capability for the manufacture of flashlamps to be used as optical pumps in laser systems. Work has been directed towards the evaluation and establishment of a series of lamps to be used as secondary standards throughout the program. A matrix of probably near-optimal variations covering the design of compressed gas cooled lamps with a 2.050 inch arc length was developed and first samples fabricated. The evaluation of liquid cooled lamps has continued. The government furnished property was received and is being tested. Modifications have been completed to the special test equipment supplied by ILC, which includes a precision power supply, water cooled laser and fluorescent analysis instrument, and four channel data acquisition system. (Modified author abstract)

AD-785 602/4GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
INITIATION AND PROPAGATION OF LASER SUPPORTED COMBUSTION WAVES,
Frank J. Allen, William F. Braerman, and Charles R. Stumpfel. 1974, 16p

Descriptors: *Laser beams, *Combustion, *Wave propagation, Lasers, Detonation waves, Ignition, Ionizing radiation.
Identifiers: *Laser supported combustion.

This paper concerns laser supported combustion waves, which occur at rather low incident intensities, and describes their ignition and propagation at sea level atmospheric pressure.

AD-785 611/5GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
DYNAMIC EFFECTS IN THERMAL BLOOMING IN HIGH POWER LASER PROPAGATION,
Rudolf G. Buser, and Robert S. Rohde. 1973, 16p

Descriptors: *Laser beams, *Thermal blooming, Focusing, Numerical analysis.
Identifiers: *Atmospheric attenuation.

AD-785 667/7GA PC$3.25/MF$2.25
Army Missile Command Redstone Arsenal Ala
MIXING GAS DYNAMIC LASERS,
Thomas G. Roberts. 1973, 14p

Descriptors: *Gas dynamic lasers, *Jet mixing flow, Expansion, Nozzle gas flow, Supersonic flow, Performance(Engineering).

The paper reports the results obtained with an arc-driven gas dynamic laser (GDL) having an aerodynamic nozzle designed so that cold CO2 or other gases can be injected either into the expanding N2 flow before it reaches the nozzle exit (supersonic mixing mode) or into the flow just before it reaches the nozzle throat (near-sonic mixing mode). The gases can also be premixed either before or upon injection into the plenum (GDL mode). The results obtained in the GDL mode with marginal plenum conditions are compared with those obtained in the supersonic and near-sonic mixing modes using cold CO2. Preliminary results are also given for operation in the supersonic mixing mode when a mixture of cold CS2 and He is injected into the N2 flow. The laser is described first and then the results are presented and discussed.

AD-785 669/3GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
20 PPS HOLMIUM: YTTRIUM LITHIUM FLUORIDE LASER TRANSMITTER,
Vincent J. Rosati. 1974, 16p

Descriptors: *Holmium, *Solid state lasers, Performance(Engineering), Atomic energy levels, Energy transfer, Doping, Fluorides, Lithium compounds, Yttrium compounds, Detectors, Laser cavities.
Identifiers: *YLF lasers, *Yttrium tetrafluoroyttriate, Design.

Holmium-doped yttrium lithium fluoride (Ho:YLF), emitting at 2.06 micrometers, is a promising material for laser target designators. In the following sections, the design and construction of a 20 pps 2 micrometer designator transmitter is presented. In the following, the systems specifications of the 1.06 micrometer lightweight designator, presently undergoing engineering development, are accepted as the relevant baseline for a 2 micrometer device. The salient features of the 1.06 micrometer device are: 100 mJ output, 20 ns pulse length, 10-20 pps, 0.2 mrad beam divergence, and 12 lb total weight.

AD-785 687/5GA PC$3.25/MF$2.25
Army Missile Command Redstone Arsenal Ala
VIBRATIONAL ENERGY TRANSFER IN HYDROGEN HALIDE LASERS,
John D. Stettler, and Norman M. Witriol. 1973, 12p

Descriptors: *Energy transfer, *Infrared lasers, Hydrogen compounds, Halides, Molecular vibrations, Gas discharges, Rates.
Identifiers: *Electric discharge lasers.

Several very important applications for high-power infrared laser radiation, generated efficiently, have been identified. These applications require either continuous or repetitively pulsed laser emission at wavelengths which can be transmitted through the atmosphere with minimal attenuation and diffractive spreading. In this paper, the authors discuss the utility of electrical discharge lasers operating in the 3.5-4.0 micrometer band and apply to them theoretical calculations for vibrational energy transfer rates that we have developed.

AD-785 730/3GA Reprint
Massachusetts Inst of Tech Cambridge
CW DYE LASER FOR ULTRAHIGH-RESOLUTION SPECTROSCOPY,
F. Y. Wu, R. E. Grove, and S. Ezekiel. 1 Apr 74, 4p
Sponsored in part by Joint Services Electronics Program.
Availability: Pub. in Applied Physics Letters, v25 n1 p73-75, 1 Jul 74.

Descriptors: *Dye lasers, *Spectroscopy, Iodine, Molecular beams, Molecular spectroscopy, Atomic spectroscopy.
Identifiers: Hyperfine structure, Rodamine 6G, Laser spectroscopy.

Hyperfine structure in a molecular beam of I2 has been observed with a resolution of one part in 10

to the 9th power using a stable jet stream cw dye laser. In addition, the dye laser was long-term stabilized to six parts in 10 to the 13th power by using an I2 molecular beam reference. (Author)

AD-785 911/9GA PC$3.75/MF$2.25
General Electric Co Philadelphia Pa Space Div
INVESTIGATION OF HIGH POWER MHD GAS LASERS.
Semi-annual rept. Jan-Aug 74,
Bert Zauderer, Eric Tate, and C. H. Marston. Aug 74, 31p
Contract N00014-74-C-0243, ARPA Order-2252
See also report dated 31 Dec 73, AD-773 975.

Descriptors: *Gas dynamic lasers, *Magnetohydrodynamics, *Carbon dioxide lasers, Carbon monoxide lasers, Magnetohydrodynamic generators, Enthalpy, Electrodes, Efficiency.
Identifiers: *Magnetohydrodynamic lasers.

This report presents the results obtained during the first half of the year 1974 in the study of MHD powered gas lasers. Key results of the work thus far are: Changes to the shock tunnel and test facility include a modified cesium seed injection system, relocation of the secondary diaphragm, installation of a primary double diaphragm and a new CO2 probe laser. Gain measurements previously reported have been repeated, with substantial improvement in the signal attributable to the above changes. Achievement of 19% enthalpy extraction in the MHD generator channel is an important step forward in generator performance. (Author)

AD-786 030/7GA PC$4.25/MF$2.25
Manlabs Inc Cambridge Mass
DEVELOPMENT OF POLYCRYSTALLINE ALKALI HALIDES BY STRAIN RECRYSTALLIZATION FOR USE AS HIGH ENERGY INFRARED LASER WINDOWS.
Final technical rept. Feb-Oct 73,
S. A. Kulin, P. P. Neshe, and K. Kreder. Jan 74, 51p AFML-TR-74-17
Contract F33615-73-C-5078

Descriptors: *Infrared lasers, *Infrared windows, *Infrared optical materials, *Laser materials, Potassium compounds, Rubidium, Europium, Chlorides, Bromides, Deformation, Crystallization, Strain(Mechanics), Compression, Fabrication, Single crystals, Orientation(Direction).
Identifiers: Potassium chloride, Potassium bromide.

The compressive deformation processing of pure KCl and KCl single crystals alloyed with Eu, Rb or Br has been investigated. The variables evaluated in this infrared alloy window fabrication process included temperature, total strain, strain rate, heating and cooling cycles, and quality and orientation of the single crystal starting material. Experimental conditions required to produce crack-free windows were established. Mechanical testing and microstructural observations were performed on such windows. This work has shown the feasibility of producing KCl alloy windows having high mechanical strengths. Further, processing conditions were developed which appear to establish the feasibility of scale-up for the fabrication of windows of very large sizes. (Author)

AD-786 077/8GA Reprint
Purdue Univ Lafayette Ind School of Mechanical Engineering
GAS-DYNAMIC PHENOMENA IN CHEMICAL LASERS.
J. G. Skifstad. 26 Sep 73, 33p
Contract DAAH01-73-C-0167
Availability: Pub. in Acta Astronautica, v1 p781-812 1974.

Descriptors: *Chemical lasers, *Gas dynamics, Nozzle gas flow, Optical properties, Gas flow, Relaxation, Diffusion, Shock waves, Turbulent flow, Kinetics, High velocity, Detonations, Flames.

The report attempts to provide an outline of some aspects of chemical lasers which seem likely to be ones where the gas dynamicist can make substantial contributions. Some phenomena in both pulsed and c.w. devices have been included. The discussion falls into four parts: gas-kinetic phenomena, gas-dynamic aspects of premixed systems, diffusion flames, and nozzle flow.

AD-786 232/9GA PC$4.25/MF$2.25
United Aircraft Research Labs East Hartford Conn
HIGH POWER DYE LASERS.
Semi-annual rept. no. 8, 1 Mar-30 Sep 74,
W. W. Murey, and W. H. Glenn. 30 Sep 74, 54p*
Rept no. UARL-N921617-8
Contract N00014-73-C-0284, ARPA Order-1806
See also AD-775 577.

Descriptors: *Dye lasers, *Flash lamps, Sparks, High power, Fluid flow, Performance(Engineering), Test methods, Electrodes.
Identifiers: *Organic dye lasers, Design.

The report describes modifications made to the previously reported high power dye laser to allow for increased power handling capability, repetition rate and operating times. Present problems are primarily involved with dye circulation and heat dissipation and the solution to these should lead to powers output from the dye laser that are well in excess of the presently available level of 41 watts. Sections cover the following: Design and testing of new flashlamps; Theory of power distribution in flashlamp; Rotary spark gap; Ray tracing program; and Dye flow system and laser power measurements.

COO-2007-47 PC$5.25/MF$2.25
Illinois Univ., Urbana.
ADVANCED COUPLING OF NUCLEAR REACTOR–GAS LASER SYSTEMS. TECHNICAL PROGRESS REPORT, AUGUST 31, 1973–AUGUST 31, 1974.
J. T. Verdeyen, G. H. Miley, and W. E. Wells. 1974, 42p
Contract AT(11-1)-2007

Descriptors: (*Lasers, *Excitation), Chemical reactions, Irradiation, Neutron reactions, Rare gases, Spectra.

For abstract, see NSA 30 08, number 20927.

LA-5619-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
CALCULATIONS OF LASER INDUCED SPALL IN ALUMINUM TARGETS.
A. R. Larson. May 74, 38p
Contract W-7405-eng-36

Descriptors: (*Aluminium, *Spallation), (*Laser radiation, *Interactions), One-dimensional calculations, Shock waves, Space-time, Targets, Thickness.

For abstract, see NSA 30 08, number 23462.

N74-29952/0GA PC$4.50/MF$2.25
Defence Standards Labs., Maribyrnong (Australia).
THERMAL BLOOMING OF A PULSED GAUSSIAN LASER BEAM.
B. C. H. Wendlandt. Mar 74, 27p REPT-557

Descriptors: *Light scattering, *Pulsed lasers, *Quadratures, *Thermal blooming, Molecular relaxation, Refractivity.

For abstract, see STAR 1219

N74-29953/8GA PC$5.75/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching (West Germany).
NEODYMIUM LIQUID LASER: CONSTRUCTION, PROPERTIES, AND SCATTERING IN THE ACTIVE MEDIUM.
R. S. Lang. Jul 73, 74p IPP-4-111
In German; English Summary.

Descriptors: *Laser modes, *Light scattering, *Liquid phases, *Neodymium, Brillouin effect, Laser outputs, Q switched lasers, Raman spectra.

For abstract, see STAR 1219

PAT-APPL-486 803 PC$3.25/MF$2.25
Department of the Air Force Washington D C
THERMAL DIFFERENTIAL COMPENSATOR.
Patent application,
Amos J. Chenoweth. Filed 9 Jul 74, 12p Rept no.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Laser modulators, Single crystals, Lithium compounds, Heaters, Birefringence.
Identifiers: PAT-CL-332-751, *Lithium tantalates, Thermal control, *Patent applications.

The field of the invention is in the art of laser beam modulation. In a laser modulator, it is necessary to establish an initial optical operating point (ideally a zero field condition) so that the modulation can be performed about that point. Establishing this desired operating point is commonly known as optical compensation. A thermal differential compensation system utilizing the temperature dependence of modulator crystal birefringence to provide optical compensation of the modulator crystals is disclosed. The system does not require any additional optical components to be placed in the optical path, thus it provides for design simplicity, easier maintainability, and higher optical transmission.

PATENT-3 789 319 Not available NTIS
Atomic Energy Commission, Washington, D.C.
HYDROGEN ROTATION-VIBRATION OSCILLATOR.
Patent,
Charles K. Rhodes. Filed 8 May 72, patented 29 Jan 74, 5p PAT-APPL-250 997
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C.

Descriptors: *Patents, *Electron beams, *Optical pumping, Gas lasers, Tritium, Deuterium, Molecular rotation.
Identifiers: *Hydrogen lasers, PAT-CL-331-94-5, Vibrational energy levels, Rotational energy levels, Double discharge lasers.

The patent describes a laser system wherein molecular species of hydrogen and hydrogen isotopes are induced to oscillate on rotational-vibrational levels by subjecting the hydrogen to a transverse beam of electrons of a narrowly defined energy between about 1 and 5 eV. High intensity and high energy output are produced.

PATENT-3 789 321 Not available NTIS
Atomic Energy Commission, Washington, D.C.
ELECTRON BEAM-PUMPED GAS LASER SYSTEM.
Patent,
Barton Krawetz, Jack B. Long, and Leonard J. Mooney. Filed 14 Sep 72, patented 29 Jan 74, 6p PAT-APPL-289 029
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Gas lasers, *Electron beams, *Optical pumping, *Gas discharges, Design, Electron guns.
Identifiers: PAT-CL-331-94-5, Pulsed lasers.

The patent describes an electron beam-initiated-and-sustained gas laser system capable of producing uniform, high energy, large-volume electrical

discharges in a high-pressure gaseous lasing medium. A thin metallic window separates the low pressure electron gun cavity from the longitudinally parallel high pressure gas cavity, such that the injected primary electrons create low energy secondary electrons which are swept across the gas cavity by an applied electric field collisionally exciting the gaseous medium. The system is applicable in both the oscillator and amplifier configurations, and is capable, for example, of producing a 10 joule/liter of active volume short CO_2 laser pulse, while being operable in a manned area due to the housing being electrically neutral.

PATENT-3 794 929 Not available NTIS
Atomic Energy Commission, Washington, D.C.
COMPACT LASER AMPLIFIER SYSTEM.
Patent,
Ronald B. Carr. Filed 13 Oct 72, patented 26 Feb 74, 4p PAT-APPL-297 537
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Lasers, *Patents, Optical pumping, Laser beams.
Identifiers: PAT-CL-330-4-3.

The patent describes a compact laser amplifier system in which a plurality of face-pumped annular disks, aligned along a common axis, independently radially amplify a stimulating light pulse. Partially reflective or lasing means, coaxially positioned at the center of each annular disk, radially deflects a stimulating light directed down the common axis uniformly into each disk for amplification, such that the light is amplified by the disks in a parallel manner. Circumferential reflecting means coaxially disposed around each disk directs amplified light emission, either toward a common point or in a common direction.

PATENT-3 798 569 Not available NTIS
Atomic Energy Commission, Washington, D. C.
HIGH ENERGY OPTICAL LASER.
Patent,
Nordin C. Anderholm, and Garth W. Gobeli. Filed 15 Mar 73, patented 19 Mar 74, 6p PAT-APPL-341 450
Government owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Optical pumping, *Flash lamps, *Lasers, Tubes, Gas discharges, Plates, Electrodes.
Identifiers: PAT-CL-331-94-5.

The patent concerns a high powered, flashlamp pumped optical laser. It uses a tubular flashlamp coaxially encompassing a lasing medium in which the flashlamp includes three parallel electrically conductive plates disposed annularly about the lasing medium perpendicular to the longitudinal axis thereof. They are spaced apart and dimensioned in a manner to provide an electrical discharge between the bottom and middle plates through a gaseous medium disposed there between. Also involved is a coaxial transmission line means for conveying the electrical energy to the middle plate and through the top plate to the bottom plate.

UCRL-51613 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
STUDIES OF LASER CALORIMETERS USING GLASS ABSORBERS AND BLACK-PAINTED ABSORBERS FROM 0.46 TO 1.06 MU M.
S. R. Gunn. 10 Jul 74, 9p
Contract W-7405-Eng-48

Descriptors: (*Lasers, *Beam monitoring), Absorption, Calorimeters, Glass, Laser radiation, Reflection.

For abstract, see NSA 30 08, number 20932.

UCRL-74959 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
X-RAY LASERS: NECESSARY CONDITIONS.
S. Slutz, G. Zimmerman, and W. Lokke. 26 Oct 73, 14p CONF-731009-12

Descriptors: (*Lasers, *X radiation), Configuration, Energy losses, Fluorescence, X-ray spectra.

For abstract, see NSA 30 08, number 20933.

UCRL-75752 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
NONLINEAR PROPAGATION STUDIES.
E. S. Bliss. 3 Jun 74, 19p CONF-740524-4

Descriptors: (*Laser radiation, *Wave propagation), Focusing, Lasers, Nonlinear problems.

For abstract, see NSA 30 08, number 20934.

20F. Optics

AD-785 615/6GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
IMAGE FORMATION BY MEANS OF SPATIAL INTENSITY CORRELATIONS,
Paul H. Deitz. 1973, 16p

Descriptors: *Optical images, Correlation techniques, Spatial distribution, Intensity.

There are a number of special benefits from detecting images by the technique of intensity correlation. (1) The method is relatively insensitive to the effects of atmospheric scintillation. (2) Because the signal is detected in the spatial-transform domain, high-frequency detail about the scattering surface translates to large spatial lags in the far field. This result could be particularly important at frequencies where detector resolution is not well developed. (3) A special advantage to intensity interferometry in the spatial domain is the utilization of guassian statistics in the spatial (not temporal) sense. By this method, sources with non-gaussian time statistics (such as single-axial-mode lasers) can be utilized. (4) Still another advantage of spatial detection is that images of moving surfaces can be formed using brief exposures.

AD-785 662/8GA PC$3.25/MF$2.25
Army Electronics Command Fort Belvoir Va Night Vision Lab
PROXIMITY FOCUSED SECOND GENERATION IMAGE INTENSIFIERS,
Herbert K. Pollehn. 1973, 16p

Descriptors: *Image intensifiers(Electronics), *Night vision devices, Noise, Signal to noise ratio, Transfer functions.

A detailed analysis of the noise and image transfer characteristics of second generation proximity focused image intensifier tubes has been made. The analysis resulted in an understanding of sufficient depth of the physical and statistical processes in the tube, forming the basis for the development of the wafer intensifier to its current status and showed the way for the development of longer life and higher performance image intensifiers.

AD-785 666/9GA PC$3.25/MF$2.25
Army Missile Test and Evaluation Directorate White Sands Missile Range N Mex
THERMAL IMAGE PROJECTOR/RECORDER,
Charles M. Redman. 1974, 16p

Descriptors: *Image projectors, Infrared images, Infrared equipment, Image converters, Display systems, Cathodes, Composite materials, Field emission.

The Thermal Image Projector/Recorder (TIPR) is a 3-stage area detector, amplifier, display system about the size of 2 dimes. The system offers high sensitivity, good resolution, high frame rates, and when developed, it should be simple and inexpensive. The TIPR is designed for flat response over the thermal energy band where there are many atmospheric windows.

AD-785 694/1GA PC$3.25/MF$2.25
Frankford Arsenal Philadelphia Pa
COMPUTER SIMULATION OF FABRICATIONAL TOLERANCES FOR MULTILAYER OPTICAL COATINGS,
John J. Walls, Jr., and Richard A. Mc Kyton. 1965, 16p

Descriptors: *Fire control systems, *Optical coatings, *Tolerances(Mechanics), Spectral lines, Spectra, Computerized simulation, Films, Thickness.
Identifiers: *Computer aided design.

Frankford Arsenal is engaged in the research, development, and manufacture of fire control systems. Items, such as optical sights, ranfefinders, telescopes, and other optical instruments form the fire control support for tanks, helicopters, mortars, and many other weapons. This paper describes a technique for predicting realistic tolerances for the numerous types of multilayer optical coatings used in fire control systems.

AD-785 799/8GA Reprint
California Inst of Tech Pasadena
BRAGG AMPLIFICATION AND OSCILLATION IN PERIODIC OPTICAL MEDIA,
Amnon Yariv, and H. W. Yen. 20 Nov 73, 5p AROD-10242.17-P
Grant DA-ARO-D-31-124-73-G64
Sponsored in part by Office of Naval Research, Arlington, Va., and Advanced Research Projects Agency, Arlington, Va.
Availability: Pub. in Optics Communications, v10 n2 p120-122 Feb 74.

Descriptors: *Coherent radiation, *Waveguides, Amplification, Gain, Laser beams, Bragg angle.

The presence of gain in a periodic optical medium causes a fundamental change of the propagation behavior near the Bragg regime. The usual evanescent decay turns into exponential amplification. Some implications of this behavior are discussed. (Author)

AD-785 947/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
DETERMINATION OF THE REFRACTIVE INDEX OF AIR BY THE DISPERSION METHOD USING RADIO WAVES,
V. N. Bondarenko. 5 Nov 73, 12p Rept no. FSTC-HT-23-0995-73
Trans. of Geodeziya i Kartografiya (USSR) n5 p52-59 1972.

Descriptors: *Air, *Refractive index, Radio waves, Light transmission, Translations, USSR.

The authors derive formulas which can be used to determine the refractive index of air with a known accuracy (an upper bound on the error). The formulas, which are based on the dispersion method, are functions of the difference of the optical paths of light and radio waves, the absolute air temperature, and atmospheric pressure.

AD-786 080/2GA Reprint
Rhode Island Univ Kingston Dept of Electrical Engineering
TRANSIENT IN BEAM POSITION CONTROL SYSTEMS FOR OPTICAL WAVEGUIDES,
E. F. Roy, and J. C. Daly. 25 Jul 73, 5p AROD-9530.2-EL
Contract DAHC04-71-C-0044
Revision of report dated 24 Oct 73.

Availability: Pub. in IEEE Transactions on Automatic Control, vAC-19 n1 p57-59 Feb 74.

Descriptors: *Waveguides, Optics, Control, Automatic, Transients.
Identifiers: *Optical waveguides.

Beam position transients in self-aligning beam waveguides are studied. The control system senses the beam position, r sub n, at each lens and introduces a corrective term C sub (n-1) to the transverse position of the preceding lens. The Laplace transform of the beam position at the nth lens, for the case of a general control function H(s), relating r sub n and C sub (n-1), is found. The special case of a confocal guide, where the control function is an integrator with gain H(s) = g/s, results in a time dependence of the beam positions at the lenses, equal to the product of a decaying exponential and Laguerre polynomials. The case where the control function H(s) represents a second-order system has been simulated on a digital computer. The results show that overshoot can be controlled by increasing the damping term in H(s). (Author)

AD-786 116/4GA Reprint
Rhode Island Univ Kingston Dept of Electrical Engineering
BEAM STABILITY CONTROL IN OPTICAL WAVEGUIDES SUBJECT TO STATISTICAL VARIATIONS,
J. E. Spence, and J. C. Daly. 1 Jun 73, 8p AROD-9530.3-EL
Contract DAHC04-71-C-0044
Availability: Pub. in IEEE Transactions on Communications, vCOM-21 n12 p1409-1414 Dec 73.

Descriptors: *Waveguides, Optics, Stability, Control, Laser beams, Approximation.
Identifiers: *Optical waveguides.

Beam position control in beam waveguides subject to statistical variations is studied. Variations in alignment and component values cause the beam to be displaced from the guide axis. A control system to correct this displacement is described. Both the expected and the rms values of the beam position are discussed. An approximate expression for the stability conditions is determined. (Author)

COM-74-11525/4GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D. C. Electricity Div.
KERR COEFFICIENTS OF NITROBENZENE AND WATER.
Final rept. 17 Sep 73-30 Jun 74,
Robert E. Hebner, Jr., Richard J. Sojka, and Esther C. Cassidy. 7 Aug 74, 36p NBSIR-74-544

Descriptors: *Water, *Kerr electrooptical effect, *Nitrobenzenes, Electromagnetic pulses, Electrical measurement, Coefficients, Electric potential.

The Kerr coefficients of both water and nitrobenzene were measured and the variation of these quantities with temperature and wavelength was investigated. At a temperature of 296K and at a wavelength of 632.8 nm, values for the Kerr coefficients were obtained. The primary conclusion drawn is that although nitrobenzene can be used for accurate measurement of a wide, and fairly well defined, variety of high voltage pulses, the situation in water is more poorly understood. The primary areas of difficulty using water are the existence of turbulence under pulses of duration of a few microseconds and the possibility of a voltage dependence of the Kerr coefficient due to a saturation of the alignment of the molecules with the applied field.

COM-74-50914/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE OPTICS OF MICRODENSITOMETRY.
Final rept.,
Richard E. Swing. Dec 73, 14p
Pub. in Opt. Eng., v12 n6 p185-198 Nov/Dec 73.

Descriptors: *Densitometers, *Optics, Reviews. Identifiers: *Microdensitometers.

A review of the current developments in microdensitometry is made, with emphasis on the investigations leading to the current level of understanding of optical performance. The classical microdensitometer is then analyzed according to the principles of the theory of partial coherence. Conditions for the insuring of linear operation are derived, and the idea of effective incoherence at the source aperture is presented with a discussion of the implications.

LA-UR-74-1053 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
DAMAGE RESISTANCE OF DIELECTRIC REFLECTORS FOR PICOSECOND PULSES.
B. E. Newnam. 1974, 11p CONF-740524-3

Descriptors: (*Titanium oxides, *Optical properties), (*Silicon oxides, Optical properties), (*Zirconium oxides, Optical properties), Coatings, Dielectric materials, Glass, Laser radiation, Pulses, Reflectivity, Refractories, Substrates.

For abstract, see NSA 30 08, number 23420.

N74-30109/4GA PC$7.75/MF$2.25
Radiation, Inc., Ann Arbor, Mich.
HOLOGRAPHIC OPTICAL ELEMENTS: FABRICATION AND TESTING.
Final Report, Jul. 1973 - Mar. 1974.
R. G. Zech, M. Shareck, and L. M. Ralston. Mar 74, 94p NASA-CR-120272, REPT-1321-F-2
Contract NAS8-28949

Descriptors: *Electro-optics, *Holography, *Performance tests, Bragg angle, Computer programs, Fourier transformation, Optical memory (Data storage).

For abstract, see STAR 1219

N74-30114/4GA PC$4.00/MF$2.25
Oregon Univ., Eugene. Inst. of Theoretical Science.
FEASIBILITY OF COHERENT X-RAY PRODUCTION BY X-RAY PUMPING.
P. L. Csonka, and B. Crasemann. 1974, 10p
NASA-CR-138943, NT-054/74
Subm-Sponsored Jointly by NASA, AEC, and Army Res. Office.

Descriptors: *Coherent radiation, *Lithium, *Optical pumping, *X ray sources, Electromagnetic fields, Electrons, Irradiation, Stimulated emission.

For abstract, see STAR 1219

N74-30116/9GA PC$7.50/MF$2.25
Electrotechnical Lab., Tokyo (Japan).
STANDARDS OF SPECTRAL RADIANCE AND IRRADIANCE FOR THE WAVELENGTH REGION OF 0.25 TO 2.5 MICROMETERS.
M. Suzuki, M. Nanjo, M. Habu, T. Nagasaka, and I. Ueda. Dec 73, 87p
In Japanese; English Summary.

Descriptors: *Infrared spectra, *Spectral emission, *Spectrum analysis, Black body radiation, Infrared instruments, Standards, Temperature distribution, Tungsten.

For abstract, see STAR 1219

N74-30119/3GA PC$5.50/MF$2.25
Keuffel and Esser Co., Morristown, N.J.
ZONE GENERATOR FOR LARGE SPACE TELESCOPE TECHNOLOGY.
Final Report.
K. E. Erickson. 19 Jun 74, 46p NASA-CR-132471
Contract NAS1-11483

Descriptors: *Large space telescope, *Performance tests, Holography, Image tubes, Lasers, Square waves.

For abstract, see STAR 1219

N74-30121/9GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SPECTRAL REFLECTANCE PROPERTIES OF BLACK CHROME FOR USE AS A SOLAR SELECTIVE COATING.
G. E. Mcdonald. 1974, 12p NASA-TM-X-71596, E-7915
Conf-Presented at the US Sect. Ann. Meeting of the Intern. Solar Energy Soc., Fort Collins, Colo., 19-23 Aug. 1974.

Descriptors: *Chromium, *Electroplating, *Reflectance, *Solar collectors, *Solar radiation, Absorption spectra, Black body radiation, Nickel, Steels.

For abstract, see STAR 1219

N74-31153/1GA PC$7.00/MF$2.25
Technische Universitaet, Brunswick (West Germany).
IMPULSE TRANSFER IN MULTIWAVE OPTICAL WAVEGUIDE FIBERS IMPULSUEBERTRAGUNG IN VIELWELLIGEN LICHTLEITFASERN.
Ph.D. Thesis.
H. J. Heyke. 1973, 78p
Language in German.

Descriptors: *Fiber optics, *Light transmission, *Mathematical models, Dielectrics, Electric fields, Impulses, Lasers, Optical waveguides.

For abstract, see STAR 1220

PATENT-3 827 807 Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
STAR SCANNER.
Patent.
R. L. Gutshall, R. T. Mcconaughey, and F. A. Volpe. Patented 6 Aug 74, 9p PAT-APPL-293 725
Misc-Filed 29 Sep. 1972 Supersedes N73-11404 (11 - 02, p 0173).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Reticles, *Star trackers, Celestial navigation, Navigation aids, Navigation instruments, Optical equipment, *Patents, Reticles, Spacecraft guidance.
Identifiers: PAT-CL-356-141.

A star scanner on a spin stabilized spacecraft is described which includes a reticle with a pair of slits having different separations as a function of the spacecraft vertical plane, to form a V slit. The time between a star image crossing one of the slits relative to a reference telemetry time provides an indication of azimuth angle. The time between the image crossing the two slits provides an indication of elevation angle of the star. If a star cluster is detected such that two stars pass the slits in less time than normally required for a single star to cross the two slits, an indication of the cluster occurrence is derived. Means are provided to prevent effective detection of large celestial bodies, such as the sun or moon.

20G. Particle Accelerators

ANL/HEP-7441 PC$4.25/MF$2.25
Argonne National Lab., Ill.
MONOENERGETIC POLARIZED NEUTRON BEAM AT THE ZGS.
W. T. Meyer. Jul 74, 24p

Descriptors: (*Zgs, *Polarized beams), (*Neutron beams, *Polarization), Breakup reactions, Deuteron reactions, Targets, Uranium.

For abstract, see NSA 30 08, number 21890.

ANL-Trans-956 PC$4.50/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Experimentelle Kernphysik.
RF LOSSES IN SUPERCONDUCTING HELIX RESONATORS (APPROX. = 100 MHZ RANGE) CAUSED BY FROZEN-IN MAGNETIC FIELD.
B. Piosczyk. Jul 74, 28p
Translation by A.H. Jaffey of IEKP II/III. Report 73-3-LIN.

Descriptors: (*Helical waveguides, *Superconductors), (*Cavity resonators, Superconductors), Electric conductivity, Energy losses, Temperature dependence.

For abstract, see NSA 30 08, number 21898.

BNL-18891 PC$20.75/MF$2.25
Brookhaven National Lab., Upton, N.Y.
PROPOSAL FOR CONSTRUCTION OF A PROTON–PROTON STORAGE ACCELERATOR FACILITY, ISABELLE.
May 74, 352p

Descriptors: (*Isabelle storage rings, *Planning), Construction, Cost, Design.

For abstract, see NSA 30 08, number 21913.

BNL-19033 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
SOME REMARKS ON COLD BORE VACUUM SYSTEMS.
H. J. Halama, and J. W. Bittner. 31 May 74, 11p

Descriptors: (*Storage rings, *Vacuum systems), (*Cryopumps, *Performance), Superconducting magnets.

For abstract, see NSA 30 08, number 21899.

BNL-19042 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
RANDOM ERROR MULTIPOLES IN SUPERCONDUCTING COSINE AND WINDOW-FRAME DIPOLES.
G. Parzen. 28 Jun 74, 4p

Descriptors: (*Isabelle storage rings, Superconducting magnets), (*Superconducting magnets, *Magnetic fields), Dipoles, Errors, Multipoles.

For abstract, see NSA 30 08, number 21900.

BNL-19062 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
EXTRAPOLATION OF THE ISABELLE DESIGN TO 400 X 400 GEV.
R. Chasman, and R. L. Gluckstern. 27 Jun 74, 11p

Descriptors: (*Isabelle storage rings, *Planning), Design.

For abstract, see NSA 30 08, number 21914.

BNL-19080 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
DYNAMIC BEAM CLEANING BY A NONLINEAR RESONANCE.
A. W. Chao, and M. Month. 26 Jun 74, 9p

Descriptors: (*Storage rings, *Beam dynamics), Beam optics, Resonance.

For abstract, see NSA 30 08, number 21915.

COO-1760-7 PC$5.25/MF$2.25
Washington Univ., St. Louis, Mo.
SUMMARY REPORT ON CYCLOTRON UTILIZATION, OPERATIONAL ACHIEVEMENTS, AND IMPROVEMENTS DURING TWELVE MONTHS ENDING MAY 31, 1974. TECHNICAL PROGRESS REPORT.
15 Jul 74, 42p
Contract AT(11-1)-1760

Descriptors: (*Cyclotrons, *Operation), Research programs.

For abstract, see NSA 30 08, number 21891.

JINR-P16-7958 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
RADIATION SHIELDING AND RADIATION FIELDS AROUND A SYNCHROPHASOTRON AT SLOW PROTON EXTRACTION.
A. I. Antipyuk, V. B. Getmanov, I. I. Bushuev, L. N. Zaitsev, and I. B. Issinskii. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Synchrotrons, *Shielding), Beam extraction, Proton beams.

For abstract, see NSA 30 08, number 21903.

LAL-RI-74-3 PC$8.25/MF$2.25
Paris-11 Univ., 91 - Orsay (France).
EXPERIMENTS WITH SEXTUPOLES ON THE ORSAY STORAGE RING (ACO).
H. Petit. Apr 74, 104p
In French. U.S. Sales Only.

Descriptors: (*Aco, *Beam optics), Beam injection, Chromatic aberrations, Electromagnetic lenses, Hexapoles.

For abstract, see NSA 30 08, number 21910.

LBL-2488 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
OBSERVATIONS ON COLLECTIVE LONGITUDINAL INSTABILITIES IN ELECTRON RINGS.
A. Faltens, G. R. Lambertson, J. M. Peterson, and J. B. Rechen. May 74, 5p CONF-740522-26
Contract W-7405-eng-48

Descriptors: (*Electron-ring accelerators, *Beam dynamics), Instability, Magnetic compression, Negative mass effect.

For abstract, see NSA 30 08, number 21911.

LBL-2490 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
ELECTRON RING PROGRAM AT LAWRENCE BERKELEY LABORAORY.
W. W. Chupp, A. Faltens, and E. C. Hartwig. May 74, 6p CONF-740522-29
Contract W-7405-eng-48

Descriptors: (*Electron-ring accelerators, *Research programs), Beam injection, Instability, Lawrence berkeley laboratory, Magnetic compression, Trapping.

For abstract, see NSA 30 08, number 21895.

LBL-3016 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
STOCHASTICITY.
L. J. Laslett. May 74, 8p CONF-740522-28
Contract W-7405-eng-48

Descriptors: (*Storage rings, *Beam dynamics), Stochastic processes, Synchrotron oscillations.

For abstract, see NSA 30 08, number 21917.

LBL-3032 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
PROTON–ELECTRON–POSITRON PROJECT: PEP.
L. Smith. 17 May 74, 19p CONF-740522-27
Contract W-7405-eng-48

Descriptors: (*Pep storage rings, *Planning), Design, Electron beams, Positron beams, Proton beams, Specifications.

For abstract, see NSA 30 08, number 21918.

LNF-74/16(P) PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
LONGITUDINAL FEEDBACK SYSTEM IN ADONE.
A. Renieri, and F. Tazzioli. 17 Apr 74, 6p CONF-740522-34
U.S. Sales Only.

Descriptors: (*Adone, *Control systems), Cavity resonators, Damping, Feedback, Synchrotron oscillations.

For abstract, see NSA 30 08, number 21919.

LNF-74/17(P) PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
NONLINEAR BEAM–BEAM EFFECT COMPUTER SIMULATION.
A. Renieri. 17 Apr 74, 5p CONF-740522-35
U.S. Sales Only.

Descriptors: (*Storage rings, *Beam dynamics), (*Colliding beams, Beam dynamics), Equations of motion, Phase space, Simulation, Stochastic processes.

For abstract, see NSA 30 08, number 21920.

LNF-74/18(P) PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
SUPER-ADONE ELECTRON–POSITRON STORAGE RING DESIGN.
F. Amman, M. Bassetti, and A. Cattoni. 19 Apr 74, 5p CONF-740522-30
U.S. Sales Only.

Descriptors: (*Adone, *Planning), (*Storage rings, Planning), Specifications.

For abstract, see NSA 30 08, number 21921.

LNF-74/19(P) PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
RESONANT METHODS FOR BEAM SIZE CONTROL IN STORAGE RINGS.
M. Bassetti. 23 Apr 74, 5p CONF-740522-31
U.S. Sales Only.

Descriptors: (*Storage rings, *Beam optics), Beam dynamics, Control systems, Resonance.

For abstract, see NSA 30 08, number 21922.

LNF-74/22(P) PC$4.00/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
ADONE: PRESENT STATUS AND EXPERIMENTS.
M. Bassetti, A. Cattoni, and V. Chimenti. 26 Apr 74, 4p CONF-740522-32
U.S. Sales Only.

Descriptors: (*Adone, *Construction), Beam optics, Operation.

For abstract, see NSA 30 08, number 21923.

NP-20044 PC$11.75/MF$2.25
Institute of Physical and Chemical Research, Wako, Saitama (Japan).
IPCR CYCLOTRON PROGRESS REPORT, 1973. VOLUME 7.
Dec 73, 172p
U.S. Sales Only.

Descriptors: (*Cyclotrons, *Operation), (*Nuclear physics, *Research programs), (*Radiochemistry, Research programs), (*Radiation chemistry, Research programs), Leading abstract, Radiobiology.

For abstract, see NSA 30 08, number 21896.

PATENT-3 794 927 Not available NTIS
Atomic Energy Commission, Washington, D.C.
SYSTEM FOR PRODUCING HIGH ENERGY POSITIVELY CHARGED PARTICLES.
Patent,
Allan A. Fleischer, George O. Hendry, and Dale K. Wells. Filed 20 Jan 70, patented 26 Feb 74, 17p PAT-APPL-4 223
Government- owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cyclotrons, *Patents, Ion beams.
Identifiers: PAT-CL-328-233.

The patent describes a system for producing high energy positively charged particles which includes in series a source of negative ions.

RL-74-052 PC$4.75/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
DESIGN STUDY FOR BEAM LINE DIPOLES (SUPERCONDUCTING).
A. D. McInturff. Apr 74, 31p
U.S. Sales Only.

Descriptors: (*Superconducting magnets, *Design), Beam optics, Beam transport, Configuration, Diagrams, Dipoles, Electric conductors, G codes, Iron, Magnetic fields, Planning, Specifications.

For abstract, see NSA 30 08, number 21904.

RL-74-053 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
LONGITUDINAL INSTABILITIES IN EPIC (E EXP +-).
H. G. Hereward. 4p EPIC/MC-46
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Beam dynamics), Beam bunching, Electron beams, Instability, Positron beams, Stability.

For abstract, see NSA 30 08, number 21924.

RL-74-054 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
REFERENCE NUMBERING SYSTEM FOR EPIC LATTICE COMPONENTS.
B. G. Loach. Mar 74, 19p EPIC/MC-26(Rev.1)
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Specifications), Coordinates, Indexes, Machine parts, Standardized terminology.

For abstract, see NSA 30 08, number 21925.

RL-74-055 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
NEW INJECTOR FOR NIMROD BEAM DIAGNOSTICS. ENERGY RAMPING MEASUREMENTS.
F. J. Swales. Mar 74, 4p
U.S. Sales Only.

Descriptors: (*Nimrod, *Beam injection), Beam monitoring, Beam monitors, Display devices, Mev range 10-100, Particle boosters, Radiation detectors, Recording systems, Wires.

For abstract, see NSA 30 08, number 21905.

RL-74-058 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
VACUUM OUTGASSING IN THE ELECTRON RING OF EPIC.
J. R. J. Bennett. Mar 74, 8p EPIC/MC-47
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Vacuum systems), Containers, Degassing, Desorption, Electron beams, Ultrahigh vacuum.

For abstract, see NSA 30 08, number 21926.

RL-74-062 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
LONGITUDINAL HEAD--TAIL EFFECT BY THE BUNCH LENGTH VARIATION METHOD.
H. G. Hereward. Apr 74, 3p EPIC/MC-48
U.S. Sales Only.

Descriptors: (*Storage rings, *Beam dynamics), (*Epic storage ring, Beam dynamics), Beam bunching, Electron beams, Energy losses, Instability, Positron beams, Synchrotron oscillations.

For abstract, see NSA 30 08, number 21927.

RL-74-078 PC$5.50/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
SCIENTIFIC CASE FOR EPIC.
G. Manning, G. Ringland, R. L. Sekulin, M. R. Harold, and F. Foster. May 74, 46p
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Planning), Electron beams, Positron beams, Proton beams.

For abstract, see NSA 30 08, number 21928.

RL-74-083 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
DESIGN AND STATUS OF EPIC.
J. R. J. Bennett, H. C. Brooks, and M. H. R. Donald. May 74, 9p CONF-740522-33
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Planning), Design, Specifications.

For abstract, see NSA 30 08, number 21929.

SAND-74-0008 PC$6.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
SANDIA LABORATORIES' HENKE X-RAY SYSTEM.
L. W. Morrison, and K. M. Glibert. Jul 74, 63p
Contract AT(29-1)-789

Descriptors: (*X-ray sources, *Design), X-ray spectra.

For abstract, see NSA 30 08, number 23474.

SLA-74-0215 PC$5.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
BREMSSTRAHLUNG PRODUCTION ON HYDRA.
S. R. Dolce. Jul 74, 49p
Contract AT(29-1)-789

Descriptors: (*Bremsstrahlung, *Beam production), Accelerator facilities, Electron beams, Tantalum.

For abstract, see NSA 30 08, number 21936.

UCID-15893 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
FORMATION OF A D EXP - BEAM FOR EFFICIENT PRODUCTION OF D EXP 0 AT HIGH ENERGIES.
J. E. Osher. 18 Aug 71, 12p
Contract W-7405-eng-48

Descriptors: (*Deuterium ions, Ion sources), (*Ion sources, *Design), Beam emittance, Beam strippers, Charge exchange, Kev range 100-1000.

For abstract, see NSA 30 08, number 21907.

ZFK-255 PC$4.75/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
PROGRESS IN THE IN-BEAM MEASUREMENTS OF NANOSECOND ISOMERS.
P. Manfrass, W. Andrejtscheff, F. Dubbers, K. D. Schilling, and W. Seidel. May 73, 34p
In German. U.S. Sales Only.

Descriptors: (*Isomeric nuclei, *Energy levels), (*Cyclotrons, *Accelerator facilities), (*Van de graaff accelerators, Accelerator facilities), Coincidence spectrometry, Gamma spectrometers, Li-drifted ge detectors, Lifetime, Reactor experimental facilities, Time resolution, Timing circuits.

For abstract, see NSA 30 08, number 21937.

20H. Particle Physics

AECL-4773 PC$7.75/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
PHYSICS DIVISION PROGRESS REPORT, 1 JANUARY TO 31 MARCH, 1974.
May 74, 94p PR-P-101
U.S. Sales Only.

Descriptors: (*Chalk river nuclear labs, *Research programs), (*Nuclear physics, Research programs), (*Ge semiconductor detectors, Research programs), (*Fuel elements, Research programs), Cooling towers, Loss of coolant, Operation, Turbulent flow, Two-phase flow, Van de graaff accelerators.

For abstract, see NSA 30 08, number 22809.

AECL-4826 PC$8.25/MF$2.25
Atomic Energy of Canada Ltd., Chalk River, Ontario. Chalk River Nuclear Labs.
DIPOLE RESPONSE COEFFICIENT FOR CYLINDRICAL CHANNELS IN NEUTRON DIFFUSION THEORY.
M. D. Love, and S. A. Kushneriuk. May 74, 103p
U.S. Sales Only.

Descriptors: Boundary conditions, Cylinders, Moderators, Neutron absorbers, Neutron diffusion equation, Neutron transport theory.

For abstract, see NSA 30 08, number 22551.

ANL/HEP-7427 PC$4.00/MF$2.25
Argonne National Lab., Ill.
STUDY OF THE REACTION P + P IMPLIES DELTA EXP ++ + X EXP 0 AT 205 GEV/C.
S. Barish, M. Derrick, B. Musgrave, P. Schultz, and J. Whitmore. 1974, 20p CONF-740713-12

Descriptors: (*Proton-proton interactions, *Inclusive interactions), (*N*resonances, *Particle production), Cross sections, Gev range 100-1000, Missing mass, Multiplicity.

For abstract, see NSA 30 08, number 22238.

ANL/HEP-7436 PC$4.50/MF$2.25
Argonne National Lab., Ill.
EXCLUSIVE NEUTRAL CURRENT REACTIONS.
P. A. Schreiner. 1974, 30p CONF-740713-13

Descriptors: (*Neutrino-neutron interactions, *Neutral currents), (*Neutrino-proton interactions, Neutral currents), Exclusive interactions, Neutrinos, Pions minus, Pions neutral, Pions plus.

For abstract, see NSA 30 08, number 22235.

ANL/NDM-6 PC$6.25/MF$2.25
Argonne National Lab., Ill.
EVALUATED NEUTRONIC CROSS SECTION FILE FOR NIOBIUM.
R. Howerton, A. Smith, P. Guenther, and J. Whalen. 1974, 63p
Contract W-31-109-eng-38

Descriptors: (*Niobium 93, Neutron reactions), (*Neutron reactions, *Cross sections), Capture, Charge-exchange reactions, Compound-nucleus reactions, Elastic scattering, Fast neutrons, Gamma radiation, Inelastic scattering, Kev range 100-1000, Mev range 01-10, Mev range 10-100, Nuclear data collections, Total cross sections, Transfer reactions.

For abstract, see NSA 30 08, number 22730.

BNL-18964 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
HEAVY-ION INDUCED TRANSFER REACTIONS: THEORY AND SOME DATA.
S. Kahana. 1974, 17p CONF-740637-5

Descriptors: (*Heavy ion reactions, *Direct reactions), Angular momentum, Differential cross sections, Elastic scattering, Inelastic scattering, Nuclear reaction kinetics, Transfer reactions.

For abstract, see NSA 30 08, number 22868.

BNWL-SA-5016 PC$4.50/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
CONVERGENCE OF THE DISCRETE ORDINATES METHOD FOR THE TRANSPORT EQUATION.
P. M. Anselone, and A. G. Gibbs. 1974, 27p CONF-740229-1

Descriptors: (*Boltzmann equation, *Discrete ordinate method), (*Transport theory, Discrete ordinate method), (*Neutron transport theory, Discrete ordinate method), Boundary conditions, Series expansion, Time dependence.

For abstract, see NSA 30 08, number 22553.

CEA-N-1703 PC$9.75/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
MEASUREMENT OF SPIN ROTATION PARAMETERS IN PI -PROTON ELASTIC SCATTERING AND DETERMINATION OF THE SCATTERING AMPLITUDES.
A. de Lesquen. Mar 74, 135p
In French. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Elastic scattering), Gev range 01-10, Gev range 10-100, Helicity, Isospin, Pions minus, Pions plus, Polarization, Polarized products, Polarized targets, Protons, Recoils, Rotation, Scattering amplitudes, Spin orientation.

For abstract, see NSA 30 08, number 22267.

COM-74-50835/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TOTAL NEUTRON CROSS SECTIONS OF URANIUM-235, URANIUM-238, AND PLUTONIUM-239 FROM 0.5 TO 15 MEV.
Final rept.,
R. B. Schwartz, R. A. Schrack, and H. T. Heaton, II. 1974, 5p
Pub. in Nuclear Science and Engineering, v54 p322-326 1974.

Descriptors: *Neutron cross sections, *Plutonium 239, *Uranium 235, Electron accelerators.
Identifiers: *Uranium 238.

The total neutron cross sections of 235U, 238U, and 239Pu were measured over the energy range 0.5 to 15 MeV, using the U.S. National Bureau of Standards electron linear accelerator as a pulsed neutron source. Neutron energies were measured by the time-of-flight method, with a resolution of 0.1 nsec/m. The measurement accuracy is estimated to be plus or minus 1%. The cross-section curve is smooth, with no observable fine structure. The data are in excellent agreement with recent results from the Rensselaer Polytechnic Institute, and in satisfactory agreement with the ENDF/B-III data file, except at the high and low energy ends of the energy range.

COM-74-50910/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
AGE OF CALIFORNIUM-252 FISSION NEUTRONS TO INDIUM RESONANCE ENERGY IN WATER.
Final rept.,
V. Spiegel. 1974, 7p
Pub. in Nuclear Science and Engineering, v54 p28-34 1974.

Descriptors: *Fission neutrons, *Californium isotopes.
Identifiers: *Californium 252.

The age of 252Cf fission neutrons to indium resonance energy (1:44 eV) was measured in water using a 7.6 mm diam by 7.6 mm high cylindrical source capsule. The correction for the displacement of moderator by the source was experimentally determined to be -0.13 cm squared or about -0.5% in approximate agreement with calculation. The distribution of indium resonance energy neutrons close to the source was measured to be Gaussian. The age measured for this experiment was 28.69 plus or minus 0.27 cm squared. The relationship for the age as a function of average source energy predicts an average energy for the 252Cf neutron spectrum of 2.146 plus or minus 0.020 MeV from this page.

CONF-731146-2 PC$4.75/MF$2.25
Argonne National Lab., Ill.
PERSISTENCE OF THE EXP 12 C + EXP 16 O IMPLIES EXP 28 SI RESONANCE IN THE REACTION EXP 13 C(EXP 16 O, EXP 17 O) EXP 12 C.
P. T. Debevec. 1974, 34p

Descriptors: (*Carbon 13, Oxygen 16 reactions), (*Oxygen 16 reactions, *Compound-nucleus reactions), Angular distribution, Carbon 12, Excitation functions, Mev range 10-100, Nuclear reaction kinetics, Oxygen 17, Resonance, Silicon 29.

For abstract, see NSA 30 08, number 22604.

CONF-740707-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
ELECTRON ATTENUATION LENGTHS IN CARBON FILMS.
E. T. Arakawa, A. J. Braundmeier, M. W. Williams, R. N. Hamm, and R. D. Birkhoff. 1973, 4p

Descriptors: (*Electrons, *Range), (*Carbon, *Charged-particle transport), Attenuation, Films, Photoelectric effect, Photons.

For abstract, see NSA 30 08, number 22960.

COO-1112-201 PC$4.00/MF$2.25
Michigan Univ., Ann Arbor.
RECENT RESULTS FROM THE NAL BUBBLE CHAMBER.
J. C. Vander Velde. 1973, 12p CONF-730841-5
Contract AT(11-1)-1112

Descriptors: Charge-exchange interactions, Correlations, Cross sections, Gev range 100-1000, Multiplicity, Pion-proton interactions, Proton-proton interactions, Spectra.

For abstract, see NSA 30 08, number 22239.

COO-1112-217 PC$4.00/MF$2.25
Michigan Univ., Ann Arbor Randall Lab. of Physics.
MEASUREMENT OF PROTON--PROTON SCATTERING WITH A POLARIZED BEAM AND A POLARIZED TARGET.
J. B. Roberts. Mar 74, 10p CONF-740226-3, UM-HE-74-9

Descriptors: (*Proton-proton interactions, *Cross sections), Elastic scattering, Gev range 01-10, Polarized beams, Polarized targets, Total cross sections.

For abstract, see NSA 30 08, number 22240.

COO-1545-141 PC$4.00/MF$2.25
Ohio State Univ., Columbus Dept. of Physics.
HIGGS TYPE LAGRANGIAN AND DUAL STRINGS.
M. Arik, and K. Tanaka. 1973, 16p
Contract AT(11-1)-1545

Descriptors: (*String models, *Lagrangian function), Duality, Quantum mechanics.

For abstract, see NSA 30 08, number 22356.

COO-2009-67 PC$4.00/MF$2.25
Indiana Univ., Bloomington Dept. of Physics.
HIGHLIGHTS OF THE INDIANA UNIVERSITY SPARK CHAMBER PROGRAM IN 1973.
B. B. Brabson, R. R. Crittenden, R. M. Heinz, and H. A. Neal. 1973, 4p
Contract AT(11-1)-2009

Descriptors: (*Protons, *Particle structure), (*Exotic resonances, *Particle production), Proton-proton interactions, Radiation detection, Research programs.

For abstract, see NSA 30 08, number 22241.

COO-2009-76 PC$4.00/MF$2.25
Indiana Univ., Bloomington; Purdue Univ., Lafayette, Ind.; Stanford Linear Accelerator Center, Calif.; Vanderbilt Univ., Nashville, Tenn.
SEARCH FOR BACKWARDS-PRODUCED EXOTIC MESON RESONANCES IN 8.4 GEV/C PI EXP + P INTERACTIONS.
M. S. Alam, B. B. Brabson, K. Galloway, R. Mercer, and N. V. Baggett. 1974, 20p CONF-740713-16

Descriptors: (*Pion-proton interactions, Exotic resonances), (*Meson resonances, *Particle production), (*Exotic resonances, Particle production), Cross sections, Gev range 01-10, Pions plus.

For abstract, see NSA 30 08, number 22268.

COO-2167-3 PC$9.00/MF$2.25
Michigan Univ., Ann Arbor Dept. of Physics.
CYCLOTRON LABORATORY ANNUAL REPORT, JUNE 15, 1973--JUNE 15, 1974.
1974, 117p
Contract AT(11-1)-2167

Descriptors: (*Nuclear physics, *Research programs), (*Cyclotrons, *Operation), Accelerator facilities, Michigan.

For abstract, see NSA 30 08, number 22605.

COO-2232A-5 PC$4.00/MF$2.25
Rochester Univ., N.Y.
EXCITATION OF THE PROTON TO LOW MASS STATES AT 180 AND 270 GEV.
Y. Akimov, L. Golovanov, and S. Mukhin. 1974, 20p CONF-740713-21, COO-3065-88

Descriptors: (*Proton-deuteron interactions, *Differential cross sections), (*N resonances, *Mass), (*Deuterium, Proton reactions), (*Proton reactions, *Inclusive interactions), Breit-wigner formula, Deuterons, Diffraction models, Energy dependence, Energy spectra, Gev range 100-1000, Missing-mass spectra, Particle widths, Recoils, Semiconductor detectors.

For abstract, see NSA 30 08, number 22242.

COO-3496-44 PC$11.75/MF$2.25
Rochester Univ., N.Y. Dept. of Chemistry.
STUDIES OF NUCLEAR FISSION, LOW-ENERGY NUCLEAR REACTIONS AND TRANSURANIC NUCLEI. PROGRESS REPORT, JUNE 1, 1973–JUNE 1, 1974.
J. R. Huizenga. 1974, 175p
Contract AT(11-1)-3496

Descriptors: (*Fission, *Research programs), (*Direct reactions, Research programs), (*Compound-nucleus reactions, Research programs), (*Heavy ion reactions, Research programs), Leading abstract, Statistical models.

For abstract, see NSA 30 08, number 22833.

COO-535-692 PC$4.00/MF$2.25
Colorado Univ., Boulder Nuclear Physics Lab.; Texas Univ., Austin Center for Nuclear Studies.
COMMENT ON MACROSCOPIC ANALYSIS OF (P,N) REACTIONS.
P. D. Kunz, L. D. Rickertsen, and G. W. Hoffmann. 1973, 8p
Contract AT(11-1)-535

Descriptors: (*Lead 208, Proton reactions), (*Proton reactions, *Quasi-elastic scattering), Angular distribution, Bismuth 208, Differential cross sections, Energy dependence, Excitation functions, Mev range 10-100, Neutrons, Nuclear potential, Optical models.

For abstract, see NSA 30 08, number 22871.

DEMO-74/6 PC$5.00/MF$2.25
Democritus Nuclear Research Center, Athens (Greece).
REFINED ISOMORPHIC MODEL OF THE CLOSED-SHELL NUCLEI: CLASSICAL PART.
G. S. Anagnostatos. Apr 74, 37p
U.S. Sales Only.

Descriptors: (*Magic nuclei, *Nuclear structure), Calcium 40, Ground states, Lead 208, Neodymium 142, Nickel 58, Oxygen 16, Shell models, Tin 112, Zirconium 90.

For abstract, see NSA 30 08, number 22876.

DESY-74/17 PC$4.75/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
COUPLED CHANNEL ANALYSIS OF THE REACTIONS GAMMA GAMMA IMPLIES PI PI AND GAMMA GAMMA IMPLIES K ANTI K.
K. Sundermeyer. Apr 74, 31p
U.S. Sales Only.

Descriptors: (*Photon-photon interactions, *Cross sections), Coupled channel theory, Dispersion relations, Kaons, Pions, S waves, Strong interactions, Unitarity.

For abstract, see NSA 30 08, number 22324.

DESY-74/18 PC$4.75/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
QUASI-ELASTIC ELECTRON SCATTERING (E,E'P) AND (E,E'D) FROM EXP 6 LI IN A COINCIDENCE EXPERIMENT.
F. H. Heimlich, E. Roessle, M. Koebberling, J. Moritz, and K. H. Schmidt. May 74, 32p
U.S. Sales Only.

Descriptors: (*Lithium 6, Electron reactions), (*Electron reactions, *Quasi-elastic scattering), Angular distribution, Coincidence methods, Cross sections, Electrons, Energy spectra, Gev range 01-10, Helium 5, Protons, Shell models, Cluster model, Deuterium, Harmonic oscillator models, Helium 4.

For abstract, see NSA 30 08, number 22611.

DESY-74/20 PC$4.50/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
HIGH ENERGY ELECTRON SCATTERING FROM EXP 6 LI AND EXP 12 C.
F. H. Heimlich, M. Koebberling, J. Moritz, K. H. Schmidt, and D. Wegener. May 74, 30p
U.S. Sales Only.

Descriptors: (*Lithium 6, Electron reactions), (*Carbon 12, Electron reactions), (*Electron reactions, *Excitation), Cross sections, Delta-1236 resonances, Electrons, Fermi gas model, Quasi-elastic scattering, Shell models, Spectra.

For abstract, see NSA 30 08, number 22612.

DESY-74/22 PC$4.00/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
MOMENTUM DISTRIBUTION OF BOUND STATE PROTONS DERIVED FROM QUASI-FREE ELECTRON SCATTERING ON EXP 12 C.
M. Koebberling, J. Moritz, K. H. Schmidt, D. Wegener, and D. Zeller. May 74, 13p
U.S. Sales Only.

Descriptors: (*Carbon 12, Electron reactions), (*Electron reactions, *Quasi-elastic scattering), Angular distribution, Boron 11, Gev range 01-10, Linear momentum, Protons, Wave functions.

For abstract, see NSA 30 08, number 22613.

FEI-427 PC$5.25/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk. Fiziko-Ehnergeticheskij Inst.
TRANSMISSION OF NEUTRONS IN SPHERICAL GEOMETRY. A SURVEY.
A. A. Van'kov, and A. M. Tsibulya. 1973, 44p
In Russian. U.S. Sales Only.

Descriptors: (*Fast neutrons, *Transmission), (*Shells, *Neutron transport), Neutron transport theory, Spheres.

For abstract, see NSA 30 08, number 22554.

FRNC-TH-479 PC$7.75/MF$2.25
Grenoble-1 Univ., 38 (France).
STRUCTURE OF EXP 3 H AND EXP 3 HE NUCLEI USING THE FADDEEV EQUATIONS IN CONFIGURATION SPACE.
A. Laverne. 1973, 92p
In French. U.S. Sales Only.

Descriptors: (*Tritium, *Nuclear structure), (*Helium 3, Nuclear structure), (*Faddeev equations, *Numerical solution), (*Three-body problem, *Computer calculations), Algorithms, Bound state, Gauss potential, Iterative methods, Nonlocal potential, Nucleon-nucleon potential, Reid potential.

For abstract, see NSA 30 08, number 22576.

IAE-2286 PC$4.50/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii.
THEORY OF MAGIC NUCLEI.
V. G. Nosov, and A. M. Kamchatnov. 1973, 26p
In Russian. U.S. Sales Only.

Descriptors: (*Magic nuclei, *Binding energy), Coupling constants, Fermi gas model, Nuclear structure, Nucleons, Orbital angular momentum, Quasi particles, Residual interactions, Shell models, Size, Spherical model.

For abstract, see NSA 30 08, number 22878.

IAE-2300 PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii.
CALCULATION BY THE MONTE CARLO METHOD OF ENERGY, TIME, AND ANGULAR CHARACTERISTICS OF THE SLOWING OF NEUTRONS IN SOME MATERIALS WITH A < 10.
V. N. Peregudov. 1973, 14p
In Russian. U.S. Sales Only.

Descriptors: (*Polyethylenes, *Neutron transport), (*Heavy water, Neutron transport), (*Beryllium, Neutron transport), (*Fast neutrons, *Angular distribution), Energy spectra, Monte carlo method, Slowing-down, Thermalization.

For abstract, see NSA 30 08, number 22555.

IFTJ-47/PS PC$4.00/MF$2.25
Institute of Nuclear Physics and Techniques, Krakow (Poland).
ORBITAL AND COVALENCY EFFECT IN MAGNETIC NEUTRON SCATTERING.
S. Kaprzyk. Jan 74, 16p
U.S. Sales Only.

Descriptors: (*Magnetic materials, Neutron reactions), (*Neutron reactions, *Elastic scattering), Covalence, Cross sections, Crystals, Electronic structure, Form factors, L-s coupling, Lcao method.

For abstract, see NSA 30 08, number 22879.

IKF-32 PC$9.25/MF$2.25
Frankfurt Univ. (F.R. Germany). Inst. fuer Kernphysik.
ANNUAL REPORT, 1973.
1973, 121p
In German. U.S. Sales Only.

Descriptors: (*Nuclear physics, *Research programs), (*Nuclear reactions, Research programs), (*Nuclear structure, Research programs), (*Atom collisions, Research programs), Auger effect, Data processing, Dielectric track detectors, German federal republic, Heavy ion reactions, Neutron diffraction, Neutron spectroscopy, Radiation protection, X radiation.

For abstract, see NSA 30 08, number 22734.

INDC(CCP)-41/U PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow.
NUCLEAR CONSTANTS, NO. 8. PART 4. PROVIDING NUCLEAR DATA FOR FAST REACTOR CALCULATIONS. TABLE OF CONTENTS.
Jul 74, 3p
Translated from Russian. U.S. Sales Only.

Descriptors: (*Fast reactors, *Nuclear data collections), Computers.

For abstract, see NSA 30 08, number 22556.

INDC(SEC)-39/U PC$5.50/MF$2.25
International Atomic Energy Agency, Vienna (Austria). Nuclear Data Section.
INDC CORRESPONDENTS FOR THE EXCHANGE OF NUCLEAR DATA INFORMATION.
Jun 74, 48p
U.S. Sales Only.

Descriptors: Iaea, Information systems, Nuclear data collections.

For abstract, see NSA 30 08, number 22557.

IPNO-T-74-04 PC$11.75/MF$2.25
Paris-6 Univ., 75 (France).
CONTRIBUTION TO THE THEORETICAL STUDY OF NUCLEAR FORCES.
B. Loiseau. Jan 74, 174p
In French. U.S. Sales Only.

Descriptors: (*Three-body problem, Nuclear forces), (*Nucleon-nucleon potential, *Boson-exchange models), (*Nuclear forces, Boson-exchange models), Dispersion relations, Interaction range, Nucleon-nucleon interactions, Yukawa potential.

For abstract, see NSA 30 08, number 22894.

IPNO-T-74-3 PC$7.00/MF$2.25
Paris-11 Univ., 91 - Orsay (France).
SELECTIVITY OF THE (D, ALPHA) REACTION AT 80 MEV. STUDY OF THE EXP 38 K, EXP 42 K, EXP 46 K, EXP 56 CO NUCLEI.
N. Frascaria. Jan 74, 80p
In French.

Descriptors: (*Deuteron reactions, *Pickup reactions), (*Calcium 40, Deuteron reactions), (*Calcium 44, Deuteron reactions), (*Calcium 48, Deuteron reactions), Alpha particles, Angular distribution, Angular momentum, Cobalt 56, Dwba, Energy levels, Mev range 10-100, Nickel 58, Occupation number, One-nucleon transfer reactions, Parity, Potassium 38, Potassium 42, Potassium 46, Spin.

For abstract, see NSA 30 08, number 22683.

IS-T-622 PC$9.75/MF$2.25
Ames Lab., Iowa.
GAMMA–GAMMA ANGULAR CORRELATION STUDIES OF CASCADES IN EXP 138 BA AND EXP 142 CE.
G. J. Basinger. Jul 74, 131p
Contract W-7405-eng-82

Descriptors: (*Barium 138, *Energy-level transitions), (*Cerium 142, Energy-level transitions), Angular correlation, Boundary conditions, Coincidence methods, Mixing ratio, Multipolarity, Nuclear cascades.

For abstract, see NSA 30 08, number 22740.

IS-T-645 PC$4.75/MF$2.25
Ames Lab., Iowa.
DEEP INELASTIC EN AND NU N SCATTERING: A UNIFIED DESCRIPTION VIA DUAL REGGE POLES AND SU(3).
D. W. Duke. Jul 74, 32p
Contract W-7405-eng-82

Descriptors: (*Electron-nucleon interactions, *Structure functions), (*Neutrino-nucleon interactions, Structure functions), (*Regge poles, Electron-nucleon interactions), (*Su-3 groups, Electron-nucleon interactions), Boundary conditions, Current algebra, Duality, Electromagnetic interactions, Particle models, Scattering amplitudes, Weak interactions.

For abstract, see NSA 30 08, number 22326.

ITEF-47 PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki.
JOINT ANALYSIS OF THE AGGREGATE OF EXPERIMENTAL DATA (THE METHOD OF COINCIDENCE OF REACTIONS).
Yu. S. Krestnikov. 1973, 20p
In Russian. U.S. Sales Only.

Descriptors: Coincidence methods, Energy dependence, Linear momentum, Nuclear reactions, Particle interactions.

For abstract, see NSA 30 08, number 22309.

ITEF-72 PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Teoreticheskoj i Ehksperimental'noj Fiziki.
DEPENDENCE UPON THE SQUARE OF THE MOMENTUM TRANSFER OF THE INCLUSIVE CROSS SECTION OF THE REACTION PI EXP - + P IMPLIES P + ANYTHING IN THE REGION OF FRAGMENTATION OF THE INCIDENT PARTICLES AT 2.13 AND 2.69 GEV/C.
B. M. Abramov, I. A. Dukhovskoi, V. V. Kishkurno, A. P. Krutenkova, and V. V. Kulikov. 1973, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Differential cross sections), Gev range 01-10, Inclusive interactions, Linear momentum, Linear momentum transfer, Pions minus, Protons.

For abstract, see NSA 30 08, number 22269.

ITF-73-176P PC$5.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SYSTEM OF CHARGED PARTICLES LIMITED BY THE PLANE SURFACE.
I. R. Yukhnovskii, and I. I. Kurylyak. 1973, 37p
In Russian. U.S. Sales Only.

Descriptors: (*Charged particles, *Electrodynamics), Distribution functions, Mathematics, Numerical solution.

For abstract, see NSA 30 08, number 23448.

ITF-74-11P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DIVISION OF INTERACTIONS AT SHORT AND LONG DISTANCES BETWEEN PARTICLES IN THE METHOD OF DISPLACEMENTS AND COLLECTIVE VARIABLES.
M. V. Vavrukh. 1974, 28p
In Russian. U.S. Sales Only.

Descriptors: Correlation functions, Coulomb field, Coulomb scattering, Distribution functions, Electron gas, Particle interactions, Perturbation theory, Potential energy, Wave functions.

For abstract, see NSA 30 08, number 23451.

ITF-74-13P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
CLUSTER STRUCTURE OF THE BOUND STATE OF THREE PARTICLE SYSTEM WITH SPACE FUNCTION OF INTERMEDIATE SYMMETRY.
V. S. Vasilevskii. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Three-body problem, *Bound state), Cluster model, Isospin, Nucleon-nucleon potential, S states, Spin.

For abstract, see NSA 30 08, number 22580.

ITF-74-14P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SCHROEDINGER EQUATIONS FOR A WAVE FUNCTION OF COLLECTIVE EXCITATIONS IN THE EIGHT NUCLEON SYSTEM.
G. F. Filippov. 1973, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Beryllium 8, *Wave functions), (*Collective model, Wave functions), Excitation, Kinetic energy, Many-body problem, Nucleons, Schroedinger equation.

For abstract, see NSA 30 08, number 22616.

ITF-74-19P PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
QUANTUM-MECHANICAL SCATTERING THEORY FOR MANY-PARTICLE SYSTEMS.
I. M. Sigal. 1974, 22p
In Russian. U.S. Sales Only.

Descriptors: (*Many-body problem, *Scattering), Quantum mechanics, Quantum operators, Wave functions.

For abstract, see NSA 30 08, number 22429.

ITF-74-30E PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
FOUR-PARTICLE MODEL OF NUCLEAR REACTIONS.
V. E. Kuz'michev. 1974, 22p
U.S. Sales Only.

Descriptors: Amplitudes, Direct reactions, Elastic scattering, Four-body problem, Nonlocal potential, One-nucleon transfer reactions, Pairing interactions, S matrix, S states, Stripping, Two-nucleon transfer reactions, Unitary pole approximation, Wave functions.

For abstract, see NSA 30 08, number 22895.

ITF-74-43P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
CALCULATION OF CROSS-SECTION OF TWO-PARTICLE ELECTRODISINTEGRATION OF EXP 3 HE AND EXP 3 H NUCLEI, TAKING INTO ACCOUNT THE FINAL-STATE INTERACTION.
V. K. Tartakovskii. 1974, 18p
In Russian. U.S. Sales Only.

Descriptors: (*Tritium, Electron reactions), (*Helium 3, Electron reactions), (*Electron reactions, *Breakup reactions), Angular distribution, Cross sections, Deuterons, Final-state interactions, K-harmonics method, Neutrons, Protons, Square-well potential.

For abstract, see NSA 30 08, number 22581.

ITF-74-44P PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
INTERPOLATION APPROACH IN CALCULATING ELECTRODISINTEGRATION IN THREE-NUCLEON NUCLEI.
V. K. Tartakovskii, I. V. Kozlovskii, and A. D. Fursa. 1974, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Tritium, Electron reactions), (*Helium 3, Electron reactions), (*Electron reactions, *Breakup reactions), Cross sections, Final-state interactions, Interpolation, Square-well potential, Wave functions.

For abstract, see NSA 30 08, number 22582.

ITF-74-46E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SOME CONSEQUENCES OF THE EQUALITY OF PP- AND NP SCATTERING TOTAL CROSS-SECTIONS.
A. I. Lend'el, and V. I. Lend'el. 1974, 12p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Total cross sections), (*Proton-neutron interactions, Total cross sections), Dispersion relations, Gev range 10-100, Scattering amplitudes.

For abstract, see NSA 30 08, number 22398.

ITF-74-52E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DUAL PROPERTIES OF DAMA.
L. L. Jenkovszky. 1974, 20p
U.S. Sales Only.

Descriptors: (*Scattering amplitudes, *Duality), Analytic functions, Mandelstam representation.

For abstract, see NSA 30 08, number 22430.

ITF-74-53P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
SIMPLE ANALYTIC MODEL FOR BOSON REGGE TRAJECTORIES.
A. I. Bugrii, and N. A. Kobylinskii. 1974, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Bosons, *Regge trajectories), Analytic functions, Exotic resonances, Mass, Meson resonances, Particle models, Singularity, Tachyons.

For abstract, see NSA 30 08, number 22363.

ITF-74-56P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
EO-CONVERSION PROBABILITY DEPENDENCE UPON EQUIVALENT RADIUS OF THE NUCLEUS R SUB 0 .
L. A. Borisoglebskii. 1974, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Nuclei, *Energy-level transitions), Matrix elements, Monopoles, Nuclear radii, Probability.

For abstract, see NSA 30 08, number 22896.

ITP-74-51E PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
ASYMPTOTICS OF TOTAL CROSS SECTIONS AND ULTIMATE TEMPERATURE OF HADRONIC SYSTEMS.
L. L. Enkovskii, and A. A. Trushevskii. 1974, 22p
U.S. Sales Only.

Descriptors: (*Hadron-hadron interactions, *Total cross sections), Asymptotic solutions, Elastic scattering, Energy dependence, Equations of state, Multiplicity, Particle production, Pomeranchuk particles, Regge poles, Resonance, S matrix, Scattering amplitudes, Thermodynamics.

For abstract, see NSA 30 08, number 22357.

JAERI-M-5536 PC$5.25/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
ESTIMATE OF UNCERTAINTIES IN THE EXPERIMENTAL DATA OF EXP 235 U(N,F), EXP 239 PU(N,F), AND EXP 238 U(N, GAMMA) CROSS SECTIONS.
A. Hasegawa, and S. Katsuragi. Jan 74, 43p
In Japanese. U.S. Sales Only.

Descriptors: (*Uranium 235, Neutron reactions), (*Plutonium 239, Neutron reactions), (*Uranium 238, Neutron reactions), (*Neutron reactions, *Fission), Cross sections, Errors, Fast neutrons, Group constants, Intermediate neutrons, Kev range 01-10, Kev range 10-100, Kev range 100-1000, Nuclear data collections, Capture, Gamma radiation, Uranium 239.

For abstract, see NSA 30 08, number 22843.

JAERI-M-5552 PC$4.50/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
ENERGY RELEASE FROM THE DECAY OF FISSION PRODUCTS.
K. Tasaka, and N. Sasamoto. Jan 74, 26p
U.S. Sales Only.

Descriptors: (*Fission products, *After-heat), Beta decay, Comparative evaluations, Decay, Gamma radiation, Lifetime, Mass formulae, Nuclear power, Q-value, Statistics.

For abstract, see NSA 30 08, number 22741.

JAERI-M-5558 PC$9.50/MF$2.25
Japan Atomic Energy Research Inst., Tokyo.
COMPUTER PROGRAM TYIELD FOR CALCULATION OF THICK-TARGET YIELDS AND CHARGED-PARTICLE RANGES.
K. Hata, H. Baba, and S. Baba. Feb 74, 128p
In Japanese. U.S. Sales Only.

Descriptors: (*Nuclear reaction yield, *Computer calculations), (*Charged particles, *Range), (*Computer codes, *T codes), Data, Elements, Energy losses, Energy range, Excitation functions, Fortran, Gev range, Mev range, Stopping power, Targets.

For abstract, see NSA 30 08, number 22963.

JINR-D7-8099 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Reactions.
SYNTHESIS OF NEUTRON-DEFICIENT ISOTOPES OF FERMIUM, KURCHATOVIUM AND ELEMENT WITH ATOMIC NUMBER 106.
Yu. Ts. Oganesyan, Yu. P. Tret'yakov, and A. S. Il'inov. 1974, 15p
U.S. Sales Only.

Descriptors: (*Lead isotopes, Heavy ion reactions), (*Heavy ion reactions, *Fusion reactions), (*Argon 40 reactions, Fusion reactions), (*Element 104, *Spontaneous fission), Element 106, Chromium 54, Cross sections, Fermium isotopes, Neutrons, Titanium 50, Half-life, Nucleosynthesis.

For abstract, see NSA 30 08, number 22844.

JINR-E1-7923 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
SOME ASPECTS OF SEMI-INCLUSIVE REACTIONS IN FOUR-PRONG PI EXP - P INTERACTIONS AT 5 GEV/C.
R. M. Lebedev, V. V. Glagolev, F. Cotorobai, C. Besliu, and A. Constantinescu. 1974, 28p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Inclusive interactions), Correlations, Gev range 01-10, Pions plus, Protons, Pions minus, N*resonances, Rho-765 resonances.

For abstract, see NSA 30 08, number 22270.

JINR-E1-8046 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
INVESTIGATION OF THE INTERACTION OF PI -MESONS WITH XENON NUCLEI AT 2.34, 3.5, 5, AND 9 GEV/C.
L. S. Okhrimenko, B. Slowinski, and Z. Strugalski. 1974, 10p CONF-740713-10
U.S. Sales Only.

Descriptors: (*Xenon, Pion reactions), (*Pion reactions, *Particle production), Angular distribution, Eta mesons, Gev range 01-10, Multiplicity, Omega-784 resonances, Pions neutral, Pions plus, Protons.

For abstract, see NSA 30 08, number 22271.

JINR-E1-8047 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
PION RADIUS.
G. Adylov, F. Aliev, D. Bardin, W. Gajewski, and I. Ioan. 1974, 20p CONF-740713-11
U.S. Sales Only.

Descriptors: (*Pions minus, *Particle radii), Electron-meson interactions, Gev range 10-100.

For abstract, see NSA 30 08, number 22229.

JINR-E1-8054 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
EXPERIMENTAL INVESTIGATION OF CUMULATIVE MESON PRODUCTION.
A. M. Baldin, N. Ghiordanescu, L. K. Ivanova, N. S. Moroz, and A. A. Povtoreiko. 1974, 27p
U.S. Sales Only.

Descriptors: (*Deuterium, *Proton reactions), (*Carbon, Proton reactions), (*Aluminium, Proton reactions), (*Copper, Proton reactions), Energy spectra, Gev range 01-10, Lead, Mesons, Particle production.

For abstract, see NSA 30 08, number 22243.

JINR-E1-8061 PC$6.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
EXPERIMENTAL RESULTS ON EXCLUSIVE PROCESSES.
K. Lanius. 1974, 58p CONF-740629-3
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Exclusive interactions), (*Kaon-proton interactions, Exclusive interactions), Angular distribution, Gev range 01-10, Gev range 10-100, Multiple production, Partial waves, Pions plus, Kaons minus.

For abstract, see NSA 30 08, number 22272.

JINR-E2-7982 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
TAIL, ZEROS, AND SPACE-LIKE REGION BEHAVIOR OF ELECTROMAGNETIC PION FORM FACTOR.
S. Dubnicka, and V. A. Meshcheryakov. 1974, 16p
U.S. Sales Only.

Descriptors: (*Pions, *Electromagnetic form factors), Dispersion relations, Sum rules.

For abstract, see NSA 30 08, number 22327.

JINR-E2-8009 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
QUANTIZATION OF CHIRAL THEORIES.
V. N. Pervushin. 1974, 20p
U.S. Sales Only.

Descriptors: (*Perturbation theory, *Chiral symmetry), Chirality, Feynman diagram, Matrix elements.

For abstract, see NSA 30 08, number 22418.

JINR-E4-7959 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
WAVE FUNCTIONS AND PARTICLE TRANSFER FORM FACTORS OF EXP 42 CA AND EXP 18 O.
E. Bang, F. A. Gareev, and R. M. Yamaleev. 1974, 27p
U.S. Sales Only.

Descriptors: (*Calcium 42, *Energy levels), (*Oxygen 18, Energy levels), (*Oxygen 16, *Triton reactions), (*Calcium 40, Triton reactions), Series expansion, Sturm-liouville equation, Wave functions, Cross sections, Form factors, Protons, Transfer reactions.

For abstract, see NSA 30 08, number 22617.

JINR-E4-7993 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
COULOMB EFFECTS IN THE EXP 3 HE IMPLIES D + P VERTEX.
I. Borbely. 1974, 9p
U.S. Sales Only.

Descriptors: (*Deuterium, Deuteron reactions), (*Deuteron reactions, *Stripping), Deuteron-deuteron interactions, Helium 3, Neutrons, One-nucleon transfer reactions, Vertex functions.

For abstract, see NSA 30 08, number 22583.

JINR-P1-7962 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
ENERGY SPECTRA OF PHOTO-NEUTRONS FROM HEAVY ELEMENTS.
V. S. Evseev, T. N. Mamedov, and O. V. Selyugin. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Tantalum 181, *Photonuclear reactions), (*Lead, Photonuclear reactions), (*Bismuth 209, Photonuclear reactions), (*Thorium 232, Photonuclear reactions), Giant resonance, Neutron spectra, Photoneutrons, Statistics.

For abstract, see NSA 30 08, number 22778.

JINR-P1-7969 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
INELASTIC PI EXP + P INTERACTIONS AT 230 AND 275 MEV.
Yu. A. Batusov, S. A. Bunyatov, G. R. Gulkanyan, V. M. Sidorov, and M. Musakhanov. 1974, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Inelastic scattering), Cross sections, Low-energy theorem, Mev range 100-1000, Neutrons, Pions plus, S waves, Scattering lengths.

For abstract, see NSA 30 08, number 22273.

JINR-P1-8036 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of High Energy.
CHARGE EXCHANGE IN PI EXP - P-INTERACTIONS AT 40 GEV/C.
N. Angelov, I. A. Ivanovskaya, E. N. Kladnitskaya, N. N. Mel'nikova, and A. Mikhul. 1974, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Charge-exchange interactions), Gev range 10-100, Limiting fragmentation, Multiperipheral model, Multiple production, Pions minus.

For abstract, see NSA 30 08, number 22274.

JINR-P2-7866 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
DIMENSIONAL PROPERTIES OF THE HAMILTONIAN DENSITY.
1974, 12p
In Russian. U.S. Sales Only.

Descriptors: Dimensions, Hamiltonians, Quantum operators, Scale invariance, Tensors.

For abstract, see NSA 30 08, number 22419.

JINR-P2-7989 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
AMPLITUDE STRUCTURE OF THE A(X IMPLIES XN)B REACTIONS.
A. S. Pak, L. Poch, and A. V. Tarasov. 1974, 7p
In Russian. U.S. Sales Only.

Descriptors: (*Knock-out reactions, *Amplitudes), (*Carbon 12, Pion reactions), (*Pion reactions, Knock-out reactions), Carbon 11, Cross sections, Final-state interactions, Mev range 100-1000, Neutrons, Pions minus, Pions neutral, Pions plus, Protons.

For abstract, see NSA 30 08, number 22897.

JINR-P3-7980 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Neutron Physics.
NEUTRON RESONANCE PARAMETERS OF EXP 161 DY AND EXP 163 DY ISOTOPES.
E. N. Karzhavina, 1974, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Dysprosium 162, *Energy levels), (*Dysprosium 164, Energy levels), (*Dysprosium 161, *Neutron reactions), (*Dysprosium 163, Neutron reactions), Level widths, Resonance, Spin, Epithermal neutrons, Ev range 01-10, Ev range 10-100, Ev range 100-1000, Intermediate neutrons, Strength functions.

For abstract, see NSA 30 08, number 22779.

JINR-P4-8013 PC$4.75/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
MICROSCOPIC DESCRIPTION OF THE CHANGE IN COLLECTIVE PARAMETERS OF EVEN--EVEN NUCLEI BY ROTATING.
D. Karadzhov, I. N. Mikhailov, and I. Piperova. 1974, 35p
In Russian. U.S. Sales Only.

Descriptors: (*Even-even nuclei, *Rotational states), Collective model, Deformed nuclei, Spin.

For abstract, see NSA 30 08, number 22898.

JINR-P6-7897 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
GAMMA-RADIATION OF EXP 160 HO.
A. A. Aleksandrov, V. S. Buttsev, Ts. Vylov, E. P. Grigor'ev, and K. Ya. Gromov. 1974, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Holmium 160, *Beta-plus decay), (*Dysprosium 160, *Energy-level transitions), Electron capture decay, Gamma spectra, Internal conversion, Isomeric nuclei, Isomeric transitions, K conversion, Multipolarity.

For abstract, see NSA 30 08, number 22780.

JINR-P6-8000 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Nuclear Problems.
EXP 158 HO RADIATION.
A. A. Aleksandrov, V. S. Buttsev, Ts. Vylov, E. P. Grigor'ev, and K. Ya. Gromov. 1974, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Holmium 158, *Beta-plus decay), Coincidence methods, Electron capture decay, Gamma spectra, Isomeric nuclei.

For abstract, see NSA 30 08, number 22781.

KFKI-74-18 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
INCLUSIVE PI EXP - P IMPLIES GAMMA + ANYTHING AND PI EXP - C EXP 12 IMPLIES GAMMA + ANYTHING REACTIONS AT 40 GEV/C.
1974, 14p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Inclusive interactions), (*Carbon 12, Pion reactions), (*Pion reactions, Inclusive interactions), Cross sections, Gev range 10-100, Spectra, Structure functions, Pions minus, Photons, Pions neutral.

For abstract, see NSA 30 08, number 22275.

KFKI-74-24 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
DRYDIFF-2: A CODE FOR THE SOLUTION OF FEW-GROUP DIFFUSION EQUATION IN ONE DIMENSION WITH GENERAL ALBEDO-TYPE BOUNDARY CONDITIONS.
I. Lux. Apr 74, 20p
U.S. Sales Only.

Descriptors: (*Computer codes, *D codes), (*Neutron diffusion equation, *Numerical solution), Albedo, Buckling, Cylindrical configuration, Finite difference method, Fortran, Icl computers, Multigroup theory, One-dimensional calculations.

For abstract, see NSA 30 08, number 22558.

KFKI-74-31 PC$4.00/MF$2.25
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
SCALING TEST IN PI EXP - P SEMI-INCLUSIVE REACTIONS.
S. Krasznovszky, and T. Ponta. 1974, 8p
U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Inclusive interactions), Differential cross sections, Gev range 01-10, Gev range 10-100, Pions minus, Scaling laws, Sum rules.

For abstract, see NSA 30 08, number 22369.

LA-4855 PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
EVXS: A CODE TO GENERATE MULTIGROUP CROSS SECTIONS FROM THE LOS ALAMOS MASTER DATA FILE.
M. W. Asprey, R. B. Lazarus, and R. E. Seamon. Jun 74, 51p
Contract W-7405-eng-36

Descriptors: (*Computer codes, *E codes), (*Neutron transport theory, Computer codes), Cross sections, Data processing, Fortran, Multigroup theory, Neutron reactions, Nuclear data collections.

For abstract, see NSA 30 08, number 22559.

LA-5563 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
MEASUREMENTS OF NEUTRON AND GAMMA-RAY SPECTRA FROM IRON AND TUNGSTEN SPHERES BOMBARDED WITH NEUTRONS FROM THE EXP 2 H(T,N) EXP 4 HE REACTION.
E. D. Arthur, G. F. Auchampaugh, and D. M. Drake. Jun 74, 20p
Contract W-7405-eng-36

Descriptors: (*Iron, *Neutron reactions), (*Tungsten, Neutron reactions), Gamma spectra, Neutron spectra, Neutron transport, Spheres.

For abstract, see NSA 30 08, number 22560.

LA-5644-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
BINX: BCD INTERPRETATION OF NEUTRON X-SECTIONS.
P. D. Soran. Jun 74, 14p
Contract W-7405-eng-36

Descriptors: (*Computer codes, *B codes), Cross sections, Data processing, Fortran, Neutron reactions, Nuclear data collections.

For abstract, see NSA 30 08, number 22561.

LBL-2366 PC$13.60/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
NUCLEAR CHEMISTRY. ANNUAL REPORT, 1973.
D. L. Hendrie, C. F. Tsang, and A. Zalkin. May 74, 521p
Contract W-7405-eng-48

Descriptors: (*Nuclear chemistry, *Research programs), (*Nuclear physics, Research programs), (*Atoms, Research programs), (*Chemical analysis, Research programs), Actinides, Activation analysis, Archaeology, Environment, Fission, Heavy ion reactions, Hyperfine structure, Lawrence berkeley laboratory, Nuclear magnetic resonance, Nuclear reactions, Nuclear structure, Nuclear theory, Nucleosynthesis, Organometallic compounds, Radiation chemistry, Radiochemistry, Rare earths, Spectroscopy, Trans 104 elements, X-ray fluorescence analysis.

For abstract, see NSA 30 08, number 22550.

LBL-2908 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
ABRASION AND ABLATION OF HEAVY IONS.
J. D. Bowman, W. J. Swiatecki, and C. F. Tsang. Jul 73, 22p
Contract W-7405-eng-48

Descriptors: (*Oxygen 16 reactions, *Total cross sections), Cross sections, Gev range 10-100, Nuclear reaction kinetics, Transfer reactions.

For abstract, see NSA 30 08, number 22899.

LBL-2938 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
EXOTIC REACTIONS IN THE LIGHT ELEMENTS.
J. Cerny. Jun 74, 18p CONF-740637-6
Contract W-7405-eng-48

Descriptors: (*Light nuclei, Heavy ion reactions), (*Heavy ion reactions, *Multi-nucleon transfer reactions), Accuracy, Bound state, Cross sections, Energy spectra, Mass formulae, Mev range 10-100, Mev range 100-1000, Reviews, Tetraneutrons, Trineutrons.

For abstract, see NSA 30 08, number 22626.

LBL-2940 PC$4.25/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
MACROSCOPIC ASPECTS OF HEAVY ION REACTIONS.
S. G. Thompson, L. G. Moretto, R. C. Jared, R. P. Babinet, and J. Galin. Jun 74, 22p CONF-740646-2
Contract W-7405-eng-48

Descriptors: (*Silver, *Argon 40 reactions), Angular distribution, Cross sections, Energy spectra, Krypton 84 reactions, Mev range 100-1000, Neon 20 reactions, Nitrogen 14 reactions, Nuclear reaction kinetics.

For abstract, see NSA 30 08, number 22743.

LBL-3002 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
MULTIPLICITY BEHAVIOR OF PI EXP - P IMPLIES PX: A MULTIPERIPHERAL MODEL DESCRIPTION.
C. F. Chan, and F. C. Winkelmann. 18 Jun 74, 13p CONF-740713-14
Contract W-7405-Eng-48

Descriptors: (*Multiperipheral model, Pion-proton interactions), (*Pion-proton interactions, *Multiplicity), Inclusive interactions, Linear momentum transfer, Missing mass, Pions minus, Protons.

For abstract, see NSA 30 08, number 22371.

LBL-3014 PC$4.50/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
PERIPHERAL THRESHOLDS AND REGGE ASYMPTOTIC EXPANSIONS.
G. F. Chew, and J. Koplik. 10 May 74, 30p CONF-740713-15
Contract W-7405-eng-48

Descriptors: (*Multiperipheral model, *Regge poles), Cross sections, Inclusive interactions, Peripheral collisions, Scattering amplitudes, Threshold energy.

For abstract, see NSA 30 08, number 22358.

LBL-3022 PC$5.50/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
ANTIBARYON PRODUCTION AND HIGH ENERGY OSCILLATIONS.
J. Koplik. Apr 74, 50p
Contract W-7405-eng-48

Descriptors: (*Proton-proton interactions, *Total cross sections), (*Antibaryons, *Particle production), Abfst equation, Cross sections, Energy dependence, Multiperipheral model, Oscillations, Regge poles, Threshold energy.

For abstract, see NSA 30 08, number 22402.

LBL-3030 PC$7.25/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
EXPERIMENTAL STUDY OF ANTI PN ANNIHILATION CROSS SECTIONS IN ANTI PD INTERACTIONS BETWEEN 1.0 AND 1.6 GEV/C.
R. H. Huesman. 25 Apr 74, 83p
Contract W-7405-eng-48

Descriptors: (*Antiproton-neutron interactions, *Cross sections), Annihilation, Gev range 01-10, Meson resonances, Total cross sections.

For abstract, see NSA 30 08, number 22245.

LUNP-7310 PC$5.75/MF$2.25
Lund Univ. (Sweden). Fysiska Institutionen.
CALCULATION OF FISSION–SPALLATION COMPETITION FOR PHOTONS AS INCIDENT PARTICLES.
B. Schroeder, G. Andersson, and B. Forkman. Sep 73, 54p
U.S. Sales Only.

Descriptors: (*Gold 197, Photonuclear reactions), (*Uranium 238, Photonuclear reactions), (*Photonuclear reactions, *Photofission), Angular distribution, Energy dependence, Energy spectra, Evaporation model, Fission barrier, Fission fragments, Linear momentum, Mev range 100-1000, Monte carlo method, Multiplicity, Neutrons, Nuclear cascades, Protons, Spallation.

For abstract, see NSA 30 08, number 22816.

N74-30138/3GA PC$4.25/MF$2.25
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
CONFIGURATION MIXING AND DEEP INELASTIC SCATTERING OF POLARIZED LEPTONS BY POLARIZED NUCLEONS.
A. Leyaouanc, L. Oliver, O. Pene, and J. C. Raynal. Mar 74, 22p LPTHE-74/19

Descriptors: *Inelastic scattering, *Leptons, *Mixing, *Nucleons, *Polarization (Spin alignment), Hadrons, Muons, Quarks, Spin-spin coupling, Wave functions.

For abstract, see STAR 1219

N74-30139/1GA PC$4.75/MF$2.25
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
STRING MODEL WITH BARYONS: TOPOLOGY, CLASSICAL MOTION.
X. Artru. May 74, 31p LPTHE-74/24

Descriptors: *Baryons, *Equations of motion, *Regge poles, *Topology, *Veneziano model, Elementary particle interactions, Nuclear models.

For abstract, see STAR 1219

N74-30140/9GA PC$4.25/MF$2.25
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
INTRODUCTION TO WEAK NEUTRAL CURRENTS.
P. Fayet. Mar 74, 23p
Conf-Presented at the 9TH Rencontre de Moriond sur les Interactions Electromagnetiques, Mar. 1974.

Descriptors: *Electromagnetic interactions, *Gauge invariance, *Neutral particles, *Particle interactions, Matrices (Mathematics), S matrix theory, Theoretical physics.

For abstract, see STAR 1219

N74-30141/7GA PC$4.00/MF$2.25
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
A POSSIBLE EXPLANATION OF THE SHRINKING OF DIFFRACTION PEAKS: COMPLEX POLES AND THE CHOU AND YANG MODEL.
R. H. Tuan. May 74, 13p LPTHE-74/23

Descriptors: *Diffraction patterns, *Elastic scattering, *Regge poles, Nuclear scattering, Pomeranchuk theorem, Scattering cross sections.

For abstract, see STAR 1219

N74-30142/5GA PC$6.25/MF$2.25
Laboratoire de Physique Theorique et des Hautes Energies, Orsay (France).
GAMMA POLARISATION IN N + P YIELDS Y + D REACTION DUE TO WEAK PARITY-VIOLATING EFFECTS.
J. Micheli, and D. Pignon. May 74, 63p LPTHE-74/16

Descriptors: *Parity, *Polarization (Charge separation), Nucleon-nucleon interactions, Phase shift, Photons, Wave functions.

For abstract, see STAR 1219

N74-30144/1GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.

COMPTON SCATTERING INDUCED BY RELATIVISTIC ELECTRONS.
Y. P. Chelkov, and V. M. Charugin. Jul 74, 16p
NASA-TT-F-15765, PR-144
Contract NASW-2485
Tran-Transl. Into English of "Indutsirovannoye Komptonovskoye Rasseyaniye Relyativistskimi Elektronami", Acad. Of Sci. Ussr, Moscow, Report PR-144, 1974 p 7-21.

Descriptors: *Compton effect, *Photon-electron interaction, *Relativistic particles, Electron scattering, Galactic nuclei, Luminous intensity, Pulsars, Quasars.

For abstract, see STAR 1219

ORNL-TM-3995 PC$6.50/MF$2.25
Oak Ridge National Lab., Tenn.
MACKLIB: 100-GROUP NEUTRON FLUENCE-TO-KERMA FACTORS AND REACTION CROSS SECTIONS GENERATED BY THE MACK COMPUTER PROGRAM FROM DATA IN ENDF FORMAT.
M. A. Abdou, and R. W. Roussin. Aug 74, 67p
Contract W-7405-eng-26

Descriptors: Cross sections, Kerma, Multigroup theory, Neutron reactions, Neutron transport, Nuclear data collections.

For abstract, see NSA 30 08, number 22562.

ORO-4317-40 PC$4.00/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
TRANSITION FROM MASS ASYMMETRY TO SYMMETRY IN THE SPONTANEOUS FISSION OF FM ISOTOPES. TECHNICAL REPORT NO. 75-008.
M. G. Mustafa. Jul 74, 14p

Descriptors: (*Fermium 256, *Spontaneous fission), (*Fermium isotopes, Spontaneous fission), Asymmetry, Corrections, Distribution, Even-even nuclei, Fission barrier, Fission fragments, Liquid drop model, Mass number, Nuclear reaction kinetics, Potential energy, Shell models, Strutinsky theory, Symmetry.

For abstract, see NSA 30 08, number 22846.

RL-74-079 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
SUM RULES FOR INVERSE PI PI SCATTERING AMPLITUDES.
A. K. Common, and M. R. Pennington. May 74, 15p
U.S. Sales Only.

Descriptors: (*Pion-pion interactions, *Scattering amplitudes), Analytic functions, Crossing symmetry, P waves, S waves, Sum rules.

For abstract, see NSA 30 08, number 22364.

RL-74-082 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
FIXED POLE SUMRULE IN PHOTON–PHOTON SCATTERING.
R. P. Worden. May 74, 14p
U.S. Sales Only.

Descriptors: (*Photon-photon interactions, *Scattering amplitudes), Elastic scattering, Parton model, Regge poles, Sum rules, Total cross sections.

For abstract, see NSA 30 08, number 22329.

RL-74-084 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
MULTIPARTICLE PRODUCTION AND THE ASYMPTOTIC BEHAVIOUR OF FORM FACTORS.
R. D. Peccei. Jun 74, 14p
U.S. Sales Only.

Descriptors: (*Form factors, *Asymptotic solutions), (*Multiple production, *Exchange interactions), (*Electron-positron interactions, *Total cross sections), Boundary conditions, Charge-exchange interactions, Kaons, Nucleons, Pions, Quantum numbers.

For abstract, see NSA 30 08, number 22330.

RL-74-41 PC$13.25/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
WORK OF THE RUTHERFORD LABORATORY IN 1973.
J. R. Smith, and F. M. Telling. May 74, 201p
U.S. Sales Only.

Descriptors: (*High energy physics, *Research programs), (*Nuclear physics, Research programs), (*Nimrod, *Accelerator facilities), Operation, United kingdom, United kingdom organizations.

For abstract, see NSA 30 08, number 22225.

TID-26612 PC$4.00/MF$2.25
Duke Univ., Durham, N.C. Dept. of Physics; North Carolina Univ., Greensboro Dept. of Physics.
NEUTRAL PARTICLE PRODUCTION FROM PI EXP + P INTERACTIONS AT 10.5 GEV/C.
J. R. Elliott, L. R. Fortney, A. T. Goshaw, J. S. Loos, and W. J. Robertson. 14p

Descriptors: (*Pion-proton interactions, *Inclusive interactions), (*Pions neutral, *Particle production), Gamma detection, Gev range 10-100, Photons, Pions plus.

For abstract, see NSA 30 08, number 22283.

UCID-16516 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
MAGNETIC NUCLEAR FORCES, AN ISING NUCLEAR MODEL, AND ASYMMETRIC FISSION.
M. H. Mac Gregor. 15 May 74, 13p
Contract W-7405-eng-48

Descriptors: (*Alpha particles, *Binding energy), Asymmetry, Fission, Magnetism, Nuclear forces, Nuclear models, Nuclear structure.

For abstract, see NSA 30 08, number 22900.

UCID-16531 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
E-DIVISION PROGRESS REPORT FY 74.
Jun 74, 11p
Contract W-7405-Eng-48

Descriptors: (*Lawrence livermore laboratory, *Research programs), (*Nuclear physics, Research programs), Fission, Neutron sources, Neutron transport, Thermonuclear reactors.

For abstract, see NSA 30 08, number 23285.

UCRL-50400(Vol.3)(Rev.1) PC$13.60/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
INTEGRATED SYSTEM FOR PRODUCTION OF NEUTRONICS AND PHOTONICS CALCULATIONAL CONSTANTS. VOLUME 3, REVISION 1. INDEX OF THE EXPERIMENTAL DATA OF NEUTRON-INDUCED INTERACTIONS.
S. T. Perkins, D. E. Cullen, R. C. Haight, R. J. Howerton, and M. H. MacGregor. 1 Mar 74, 905p
Contract W-7405-eng-48

Descriptors: (*Neutron reactions, *Indexes), Cross sections, Tables.

For abstract, see NSA 30 08, number 22565.

UCRL-51603 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
EVALUATED NEUTRON-INTERACTION AND GAMMA-RAY-PRODUCTION CROSS SECTIONS OF EXP 9 BE FOR ENDF/B-IV. MAT NO. 1289.
R. J. Howerton, and S. T. Perkins. 18 Jun 74, 16p
Contract W-7405-eng-48

Descriptors: (*Beryllium 9, *Neutron reactions), Alpha particles, Cross sections, Deuterons, Elastic scattering, Ev range, Gamma radiation, Kev range, Mev range, Milli ev range, Neutrons, Nuclear data collections, Protons, Tables, Tritons.

For abstract, see NSA 30 08, number 22631.

UCRL-75694 PC$9.75/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
ATLAS OF PHOTONEUTRON CROSS SECTIONS OBTAINED WITH MONOENERGETIC PHOTONS. SECOND EDITION.
B. L. Berman. 6 May 74, 134p CONF-740806-1

Descriptors: (*Nuclei, Photonuclear reactions), (*Photonuclear reactions, *Cross sections), Nuclear data collections, Photoneutrons, Tables.

For abstract, see NSA 30 08, number 22584.

UJV-3080-P PC$9.00/MF$2.25
Ustav Jaderneho Vyzkumu, Rez (Czechoslovakia).
PROGRAM ABSTRACTS. PART 2. 701--1700.
J. Schmid. Jan 74, 118p
In Czech. U.S. Sales Only.

Descriptors: Computer codes, Nuclear physics, Research programs.

For abstract, see NSA 30 08, number 22901.

USIP-73-11 PC$4.00/MF$2.25
Stockholm Univ. (Sweden). Fysiska Institutionen.
G-FACTOR OF THE 1291.5-KEV STATE IN EXP 59 CO.
C. Bargholtz, S. Beshai, L. Eriksson, L. E. Froeberg, and L. Gidefeldt. Sep 73, 15p
U.S. Sales Only.

Descriptors: (*Cobalt 59, *Energy levels), Energy-level transitions, Excited states, Gamma cascades, Gyromagnetic ratio, Hyperfine structure, Integral pac, Magnetic fields, Nuclear magnetic moments, Unified model.

For abstract, see NSA 30 08, number 22714.

ZFK-260 PC$4.50/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
INVESTIGATION OF EXP 185 W AND EXP 187 W IN THE (N, GAMMA) REACTION.
H. Prade, W. Andrejtscheff, P. Manfrass, M. Mohsen, and W. Seidel. Jul 73, 27p
In German. U.S. Sales Only.

Descriptors: (*Tungsten 184, Neutron reactions), (*Tungsten 186, Neutron reactions), (*Neutron reactions, *Capture), (*Tungsten 185, *Energy levels), Tungsten 187, Coincidence methods, Gamma spectra, Binding energy, Energy-level transitions, Lifetime.

For abstract, see NSA 30 08, number 22782.

ZFK-262 PC$18.00/MF$2.25
Deutsche Akademie der Wissenschaften zu Berlin (German Democratic Republic); Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
JOINT ANNUAL REPORT, 1973.
D. Netzband. Sep 73, 297p
In German. U.S. Sales Only.

Descriptors: (*Van de graaff accelerators, *Operation), (*Cyclotrons, Operation), (*Nuclear physics, *Research programs), Accelerator facilities, German democratic republic, Leading abstract, Nuclear reactions, Nuclear structure, Nuclear theory.

For abstract, see NSA 30 08, number 22783.

20I. Plasma Physics

AD-785 618/0GA PC$3.25/MF$2.25
Harry Diamond Labs Washington D C
SIMULATION OF A SIMPLE LORENTZ PLASMA WITH A RANDOM DISTRIBUTION OF INDUCTIVELY-LOADED DIPOLES.
John F. W. Dietz, and George Merkel. 1973, 16p

Descriptors: *Electromagnetic pulses, *Plasmas(Physics), Waveforms, Waveguides, Mathematical models.
Identifiers: Lorentz plasmas.

The complete simulation of the electromagnetic pulse, EMP, associated with a nuclear burst involves a number of interrelated parameters. The most obvious parameter are the waveform and the magnitude of E.MP. However, if the system being subjected to the nuclear EMP is in a preionized region such as the ionosphere, it would also be necessary to simulate the ionization or dielectric constant of the medium surrounding the system such as a missile or satellite. In this work the authors investigate the feasibility of using an artificial dielectric consisting of a random distribution of inductively-loaded short dipoles to simulate the macroscopic electromagnetic properties of a simple Lorentz plasma.

AD-785 842/6GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
FILTER AND FILM METHOD OF MEASURING THE TEMPERATURE OF A HOT, DENSE, LOW-Z PLASMA FROM ITS QUANTUM BREMSSTRAHLUNG.
Final rept.,
Kent A. Gerber, and B. Grant Logan. 23 Jul 74, 23p Rept no. NRL-7775

Descriptors: *Plasmas(Physics), *Electron energy, Quantum theory, Bremsstrahlung, Thin films, Solid state physics.

Results of calculations of the total integrated x-ray quantum bremsstrahlung emission transmitted through absorbers of aluminum, copper and carbon (polyethylene) are presented for a range of plasma temperatures and absorber thickness for both ideal detectors and for film. Such information is useful in obtaining values for the electron temperature in a plasma from measurements of the x-ray continuum emission. (Author)

AD-786 110/7GA PC$3.75/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
THE ANALYSIS AND INVESTIGATION OF CATHODE PROCESSES IN A HIGH-CURRENT ARC DISCHARGE.
A. M. Dorodov. 31 Jul 74, 42p Rept no. FTD-MT-24-1070-74
Edited machine trans. of mono. Plazmennye Uskoriteli, n.p., 1973 p157-179, by Charles T. Ostertag, Jr.

Descriptors: *Plasma accelerators, *Electric arcs, Cathodes, Translations, USSR.

AD-786 276/6GA Reprint
Stanford Univ Calif Dept of Aeronautics and Astronautics
MEASUREMENT OF ELECTRICAL CONDUCTIVITY OF ARGON AT HIGH PRESSURE.
U. Bauder, R. S. Devoto, and D. Jukherjee. 13 Dec 72, 8p ARL-74-0052
Contract F33615-71-C-1289
Availability: Pub. in The Physics of Fluids, v16 n12 p2143-2148 Dec 73.

Descriptors: *Argon, *Electric arcs, *Electrical conductivity, Transport properties.
Identifiers: *Argon plasma.

Measurement have been carried out of the current, electric field strength, and radial temperature distribution in a 5 mm diam. wall-stabilized electric arc in argon at pressures from 1-200 atm. These data have been analyzed to determine the electrical conductivity as a function of temperature and pressure. The results are in reasonable accord with other measurements to 10 atm and with theory. (Author)

CLM-R-129 PC$4.00/MF$2.25
UKAEA Research Group, Abingdon. Culham Lab.
GENERAL PURPOSE CONTINUOUS OBSERVATION INFRA-RED VIEWER.
S. A. Hamadto. Jan 74, 17p
U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Infrared radiation), (*Radiation detectors, Infrared radiation), Crystals, Performance.

For abstract, see NSA 30 08, number 20846.

COM-74-50908/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TIME-DEPENDENT PLASMA MICROFIELD DISTRIBUTION.
Final rept.,
L. J. Roszman, and C. F. Hooper, Jr. 1974, 28p
Pub. in Physica, v73 p259-286 1974.

Descriptors: *Plasmas(Physics), *Gas dynamics.
Identifiers: Ion ion interactions.

The theory of the distribution of the finite-interval time average of the time-dependent low-frequency microfield (ion produced) in a plasma containing ion-ion correlations is developed. The plasma model contains ion-ion interactions in the appropriate statistical ensemble (statistical ion correlations), but does not contain ion interactions in its dynamics (free-streaming dynamics). The theory allows inclusion of statistical ion correlations to any order. A discussion of all approximations is included.

COO-3421-9 PC$6.75/MF$2.25
Pennsylvania State Univ., University Park.
EXPERIMENTAL AND THEORETICAL INVESTIGATION OF AN INERTIAL, ELECTROSTATIC CONFINEMENT DEVICE. FINAL REPORT, JUNE 15, 1969–JUNE 15, 1973.
E. H. Klevans, and J. W. Robinson. 1973, 72p
Contract AT(11-1)-3421

Descriptors: (*Thermonuclear devices, *Electrostatics), Confinement, Electron density, Electron temperature, Ion beam injection, Plasma, Research programs.

For abstract, see NSA 30 08, number 20840.

EUR-CEA-FC-691 PC$14.00/MF$2.25
Association Euratom-CEA, Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Groupe de Recherches sur la Fusion Controlee; CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Physique du Plasma et de la Fusion Controlee.
STATISTICAL MECHANICS OF NONUNIFORM SYSTEMS SUBJECTED TO AN ARBITRARY AND TIME DEPENDENT EXTERNAL FIELD. DYNAMICS OF NONKINETIC STATES AND THE SUPERKINETIC EQUATION. APPLICATION TO STRONG PLASMA TURBULENCE.
R. Balescu, and J. H. Misguich. May 73, 218p
In French. U.S. Sales Only.

Descriptors: (*Collisional plasma, *Kinetic equations), Correlations, Distribution functions, Magnetic fields, Quasilinear problems, Statistical mechanics, Stochastic processes, Time dependence, Turbulence.

For abstract, see NSA 30 08, number 20861.

EUR-CEA-FC-715 PC$4.25/MF$2.25
Association Euratom-CEA, Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Groupe de Recherches sur la Fusion Controlee; CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Physique du Plasma et de la Fusion Controlee.
SPECTROSCOPIC DETERMINATION OF PARTICLE CONFINEMENT TIMES IN TFR TOKAMAKS.
C. Breton, M. Mattioli, and B. Ya'akobi. Dec 73, 23p
In French. U.S. Sales Only.

Descriptors: (*Tfr tokamak, *Confinement), (*Plasma, Confinement), Deuterium, Diffusion, Emission spectroscopy, Errors, Impurities, Molybdenum ions, Oxygen ions.

For abstract, see NSA 30 08, number 20841.

EUR-CEA-FC-718 PC$4.00/MF$2.25
Association Euratom-CEA, Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Groupe de Recherches sur la Fusion Controlee; CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Physique du Plasma et de la Fusion Controlee.
KINETIC EQUATIONS FOR PLASMAS SUBMITTED TO A STRONG TIME-DEPENDENT EXTERNAL FIELD. IV. RENORMALIZED STOCHASTIC TREATMENT AND KRAICHNAN MODEL EQUATION FOR TURBULENCE.
R. Balescu, and J. H. Misguich. Dec 73, 15p
U.S. Sales Only.

Descriptors: (*Plasma, *Kinetic equations), Fluid flow, Magnetic fields, Stochastic processes, Time dependence, Turbulence.

For abstract, see NSA 30 08, number 20862.

FEI-406 PC$6.25/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk. Fiziko-Ehnergeticheskij Inst.
SOME QUESTIONS OF THE THEORETICAL BASIS OF THE MAGNETIC METHOD FOR MEASURING VELOCITIES IN CANALS OF COMPLEX FORM.
V. I. Mikhin, A. V. Zhukov, and P. A. Ushakov. 1973, 64p
In Russian. U.S. Sales Only.

Descriptors: (*Magnetohydrodynamics, *Velocity), Electric conductivity, Electrodes, Magnetic fields, Mhd channels.

For abstract, see NSA 30 08, number 22211.

IPP-III-12 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
ENERGY DISTRIBUTION OF ELECTRONS IN A PROTON–ELECTRON PLASMA WITH DEN-

SITIES HIGHER THAN THE SOLID-STATE DENSITY.
H. Wulff. May 74, 20p
In German. U.S. Sales Only.

Descriptors: (*Plasma, *Energy spectra), Bohr theory, Electrons, Pauli principle, Plasma density, Protons, Virial theorem.

For abstract, see NSA 30 08, number 20864.

IPP-IV-71 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
FINITE TEMPERATURE EFFECTS ON THE LOWER-HYBRID DISPERSION CHARACTERISTICS.
S. Puri, and M. Tutter. Apr 74, 12p
U.S. Sales Only.

Descriptors: (*Plasma waves, *Hybrid resonance), Cyclotron frequency, Electric conductivity, Hot plasma, Tensors.

For abstract, see NSA 30 08, number 20908.

IPP-IV-72 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
SOME ASPECTS OF PLASMA DIAGNOSTICS BY MEANS OF A DIAMAGNETIC COIL.
H. M. Mayer. May 74, 20p
U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Magnetic probes), Charged particles, Electronic circuits, Magnetic moments.

For abstract, see NSA 30 08, number 20847.

IPP-6/124 PC$4.25/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
CURRENT FILAMENTATION IN PARALLEL FIELD TURBULENT PLASMAS.
D. Biskamp, and W. Horton. Mar 74, 24p
U.S. Sales Only.

Descriptors: (*Plasma, *Electric currents), Electric conductivity, Ion acoustic waves, Plasma simulation, Turbulence.

For abstract, see NSA 30 08, number 20863.

JINR-P9-7970 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Computing Techniques and Automation.
MODELING OF DECELERATION OF RELATIVISTIC ELECTRON BEAM IN DENSE PLASMA.
I. L. Bogolubskii. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Beam-plasma systems, *Mathematical models), Computer calculations, Electron beams, Motion, Relativistic range.

For abstract, see NSA 30 08, number 20865.

JUL-1074-RG PC$6.75/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorentwicklung.
NEUTRONIC MEASUREMENTS IN A DENSE PLASMA FOCUS.
P. Cloth. May 74, 71p
In German. U.S. Sales Only.

Descriptors: (*Plasma focus devices, *Neutron spectra), (*Plasma diagnostics, Neutron spectra), Deuterium, Lithium 7.

For abstract, see NSA 30 08, number 20850.

LBL-2470 PC$11.75/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
HIGH-FREQUENCY STARK EFFECT AND ITS APPLICATION TO PLASMA DIAGNOSTICS.
W. W. Hicks. Dec 73, 174p
Contract W-7405-eng-48

Descriptors: (*Plasma diagnostics, *Stark effect), (*Hydrogen, *Spectra), (*Helium, Spectra), Matrices, Schroedinger equation.

For abstract, see NSA 30 08, number 20851.

LRP-80/74 PC$4.00/MF$2.25
Ecole Polytechnique Federale, Lausanne (Switzerland).
PARAMETRIC INSTABILITIES OF ORDINARY AND HYBRID WAVES.
May 74, 18p
U.S. Sales Only.

Descriptors: (*Plasma instability, *Parametric instabilities), Amplitudes, Brillouin effect, Coupling, Excitation, Magnetic fields, Plasma waves.

For abstract, see NSA 30 08, number 20872.

LRP-82/74 PC$4.50/MF$2.25
Ecole Polytechnique Federale, Lausanne (Switzerland).
PLASMA WAVE EXPERIMENT: A PRESENTATION OF THE DEVICE AND FIRST EXPERIMENTAL RESULTS.
M. Bitter, and P. J. Paris. May 74, 30p
U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Bernstein mode), (*Glow discharges, Bernstein mode), Collisionless plasma, Distribution, Electrons, Low-beta plasma, Plasma instability, Plasma waves, Velocity.

For abstract, see NSA 30 08, number 20852.

N74-29637/7GA PC$9.25/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
HIGH CURRENT DISCHARGES IN A FORCED GAS FLOW.
Ph.D. Thesis.
F. J. Andriessen. 9 Oct 73, 125p

Descriptors: *Arc discharges, *Electric contacts, *Electric discharges, *Gas flow, *Heat transfer, Energy dissipation, Molecular energy levels, Temperature distribution, Thermal radiation.

For abstract, see STAR 1219

N74-30115/1GA PC$4.00/MF$2.25
Tokyo Univ. (Japan). Inst. of Space and Aeronautical Science.
ANOMALOUS RESISTIVITY IN A MAGNETIC NEUTRAL POINT.
N. Ohyabu, and N. Kawashima. May 74, 10p
ISAS-512-VOL-39-NO-9

Descriptors: *Electrical resistivity, *Magnetic field configurations, Electric discharges, Electric potential, Electrodes, Electron energy, Plasma density, Thermal energy, X ray absorption.

For abstract, see STAR 1219

N74-30159/9GA PC$4.00/MF$2.25
Ecole Polytechnique Federale de Lausanne (Switzerland). Centre de Recherches en Physique des Plasmas.
PARAMETRIC INSTABILITIES OF ORDINARY AND HYBRID WAVES.
N. T. Hung. May 74, 19p LRP-80/74
Subm-Sponsored in Part by Swiss Natl. Sci. Foundation.

Descriptors: *Magnetic fields, *Magnetohydrodynamic stability, *Plasma dynamics, *Raman spectra, *Wave propagation, Brillouin effect, Numerical analysis, Plasma diagnostics, Plasma spectra, Plasma waves.

For abstract, see STAR 1219

N74-30160/7GA PC$4.75/MF$2.25
Ecole Polytechnique Federale de Lausanne (Switzerland).
PLASMA WAVE EXPERIMENT: A PRESENTATION OF THE DEVICE AND FIRST EXPERIMENTAL RESULTS.
M. Bitter, and P. J. Paris. May 74, 31p LRP-82/74
Conf-Presented at Reunion de la Soc. Suisse de Phys., Berne, Switzerland, 26-27 Apr. 1974.

Descriptors: *Collisionless plasmas, *Plasma diagnostics, *Plasma waves, Electrons, Glow discharges, Magnetic fields, Magnetohydrodynamic stability.

For abstract, see STAR 1219

PATENT-3 817 622 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
MEASUREMENT OF PLASMA TEMPERATURE AND DENSITY USING RADIATION ABSORPTION.
Patent.
K. W. Billman, P. D. Rowley, J. R. Stallcop, and L. L. Presley. Patented 18 Jun 74, 6p PAT-APPL-318 151
Misc-Filed 26 Dec. 1972 Supersedes N73-29750 (11 - 20, p 2458).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electron distribution, *Plasma density, *Plasma diagnostics, *Plasma temperature, *Patents, Plasma flux measurements, Radiation absorption.
Identifiers: PAT-CL-356-73.

A procedure, using a light beam of predetermined wavelength, preferably monochromatic, for measuring plasma characteristics is presented. Light absorbed by the plasma is used to obtain an absorption coefficient for the plasma. From this known coefficient and independent measurement of either the electron density or temperature of the plasma, an equation may be solved to obtain other unknown quantities. In this procedure, the absorption coefficient of the plasma is derived simultaneously for two probing light beams of substantially different predetermined wavelengths. These two coefficients are used to solve the two equations, which are in turn used to determine plasma electron density and temperature.

UCRL-51591 PC$15.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
NUMERICAL STUDIES OF RESISTIVE INSTABILITIES IN DIFFUSE PINCHES.
J. A. Dibiase. May 74, 242p
Contract W-7405-eng-48

Descriptors: (*Tokamak devices, *Mathematical models), (*Plasma instability, Mathematical models), Electric conductivity, Equilibrium plasma, Thermal conductivity, Toroidal pinch devices, Viscosity.

For abstract, see NSA 30 08, number 20873.

UCRL-74937 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
PHYSICS OF LASER-IGNITED PELLETS: IMPLOSION HYDRODYNAMICS OF FERMI

GASES AND CENTRAL THERMONUCLEAR BURN INITIATION.
L. Wood, and J. Nuckolls. 30 Oct 73, 11p CONF-731009-11

Descriptors: (*Laser-produced plasma, *Hydrodynamics), (*Laser-radiation heating, Hydrodynamics), Compression, Implosions, Thermonuclear reactions.

For abstract, see NSA 30 08, number 20869.

20J. Quantum Theory

AD-785 760/0GA Reprint
Massachusetts Inst of Tech Cambridge
COMMENTS ON 'FURTHER REMARKS ON THE PRINCIPLE OF VIRTUAL POWER',
H. A. Haus, J. A. Kong, and P. Penfield, Jr. 25 Feb 74, 6p
Contract DAAB07-71-C-0300
Availability: Pub. in Lettere al Nuovo Cimento, v10 n6 p222-226, 8 Jun 74.

Descriptors: *Relativity theory, Lorentz force, Transformations(Mathematics), Tensor analysis.
Identifiers: *Special relativity, *Virtual power, Lorentz transformation.

COM-74-50829/2GA
Not available from NTIS
National Bureau of Standards, Washington, D.C.
GAUGE INVARIANCE OF THE VACUUM POLARIZATION IN QUANTUM ELECTRODYNAMICS.
Final rept.,
Michael Danos, and Johann Rafelski. 18 May 74, 15p
Pub. in Lettere al Nuovo Cimento, ser2 v10 n3 p106-110, 18 May 74.

Descriptors: *Quantum electrodynamics, *Field theory(Physics), Invariance, Weak interactions, S matrix theory.
Identifiers: Gauge conditions.

It is shown that the conventional perturbation formalism of field theory treats incorrectly the equal time point in the chronological products of field operators. If this imprecision is rectified the contradictions between the results of the perturbation expansion of the S-matrix and of the predictions of axiomatic field theory disappear. In particular, the guage invariance violating quadratic divergence of the vacuum polarization loop does not arise in the S-matrix formulation. This is of particular importance for certain classes of the so-called non-renormalizable field theories, e.g., the Fermi-type theories of the weak interactions.

DESY-74/15 PC$4.00/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
INVARIANCE OF THE S-MATRIX UNDER POINT TRANSFORMATIONS IN RENORMALIZED PERTURBATION THEORY.
R. Flume. Apr 74, 8p
U.S. Sales Only.

Descriptors: (*S matrix, *Invariance principles), (*Lagrangian field theory, S matrix), Perturbation theory, Renormalization.

For abstract, see NSA 30 08, number 23013.

INFN/AE-73/7 PC$6.50/MF$2.25
Istituto Nazionale di Fisica Nucleare, Rome (Italy).
SPECIAL RELATIVITY EXTENDED TO SUPERLUMINAL FRAMES AND OBJECTS (CLASSICAL THEORY OF TACHYONS).
R. Mignani, and E. Recami. 15 Nov 73, 67p
U.S. Sales Only.

Descriptors: (*Tachyons, *Relativity theory), Causality, Cpt theorem, Duality, Gravitational fields, Lorentz transformations.

For abstract, see NSA 30 08, number 22998.

ITF-74-20E PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
GENERAL CONCEPT OF QUANTIZATION.
F. A. Berezin. 1974, 28p
U.S. Sales Only.

Descriptors: (*Quantum mechanics, *Lobachevsky geometry), Phase space, Two-dimensional calculations.

For abstract, see NSA 30 08, number 22999.

ITF-74-31P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
FOURIER TRANSFORMATION OF HYPERFUNCTIONS AND FORMULATION OF THE BASIC AXIOMS AND THE QUANTUM FIELD THEORY PRINCIPLES IN TERMS OF HYPERFUNCTIONS. I.
G. D. Romanko, and I. V. Khimich. 1974, 29p
In Russian. U.S. Sales Only.

Descriptors: Fourier transformation, Functions, Mathematical space, Quantum field theory.

For abstract, see NSA 30 08, number 23015.

ITF-74-33P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DYNAMIC MASS SPLITTING IN TWO-FERMION ELECTRODYNAMICS WITH SPONTANEOUSLY BROKEN SYMMETRY.
P. I. Fomin, and V. V. Shapovalov. 1974, 28p
In Russian. U.S. Sales Only.

Descriptors: Fermions, Green function, Isospin, Mass, Perturbation theory, Quantum electrodynamics, Renormalization, Symmetry breaking, Vertex functions.

For abstract, see NSA 30 08, number 23016.

ITF-74-34E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
GENERALIZED MOMENT PROBLEM.
V. A. Yatsun. 1974, 18p
U.S. Sales Only.

Descriptors: Boundary conditions, Mathematics, Scattering amplitudes.

For abstract, see NSA 30 08, number 23000.

ITF-74-38P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
EQUIVALENCE THEOREM AND REGULARIZATION IN QUANTUM FIELD THEORY.
O. A. Mogilevskii, and M. L. Rutenberg. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: Quantum field theory, Renormalization, S matrix.

For abstract, see NSA 30 08, number 23017.

ITF-74-39P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
NON-LOCAL QUANTUM ELECTRODYNAMICS OF THE SPIN S = 3/2.
O. A. Mogilevskii. 1974, 29p
In Russian. U.S. Sales Only.

Descriptors: Causality, Coupling constants, Feynman diagram, Gauge invariance, Perturbation theory, Quantum electrodynamics, S matrix, Spin, Unitarity.

For abstract, see NSA 30 08, number 23018.

ITF-74-54E PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
EUCLIDEAN FERMI FIELDS AND GREEN FUNCTIONS WITHOUT MOMENTUM CUTOFF IN THE YUKAWA SUB 2 FIELD THEORY.
A. L. Rebenko. 1974, 32p
U.S. Sales Only.

Descriptors: (*Yukawa nonlocal theory, *Fermions), Annihilation operators, Creation operators, Euclidean space, Green function, Perturbation theory, S matrix.

For abstract, see NSA 30 08, number 23014.

ITP-74-26E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
CRITERION OF ESSENTIAL SELF-ADJOINTNESS OF OPERATORS.
Ya. M. Yakymiv. 1974, 11p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Hermitian operators), Hilbert space, Quantum mechanics.

For abstract, see NSA 30 08, number 23001.

JINR-P2-7972 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
MASSIVE VECTOR FIELD AND THE HORIZON SURFACE.
G. V. Isaev. 1974, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Field theories, *Vector fields), Black holes, Gravitation, Mass.

For abstract, see NSA 30 08, number 23040.

JINR-P2-7995 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
MODIFIED DIRAC EQUATION IN QUANTUM FIELD THEORY.
L. S. Dul'yan, and R. N. Faustov. 1974, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Dirac equation, *Quantum field theory), Bound state, Coulomb field.

For abstract, see NSA 30 08, number 23019.

N74-30028/6GA PC$20.25/MF$2.25
Wisconsin Univ., Madison. Theoretical Chemistry Inst.
TIME-DEPENDENT PERTURBATION OF A TWO-STATE QUANTUM MECHANICAL SYSTEM.
D. R. Dion. 7 Jun 74, 341p NASA-CR-139250, WIS-TCI-502
Contracts NGL-50-002-00, NSF GP-28213

Descriptors: *Monochromatic radiation, *Quantum mechanics, Perturbation theory, Schroedinger equation, Time dependence, Wave functions.

For abstract, see STAR 1219

N74-30117/7GA PC$4.75/MF$2.25
Laboratoire de Physique Theorique et des Hautes Energies, Paris (France).
ASYMPTOTIC BEHAVIOUR FROM THE EXACT CALLAN-SYMANZIK EQUATIONS.
P. Meyer, and N. Sourlas. Jun 74, 35p LPTHE-74/15, PTENS-74/1

Descriptors: *Asymptotic methods, *Green function, Differential equations, Euler-lagrange equa-

tion, Feynman diagrams, Momentum, Perturbation theory, Symmetry.

For abstract, see STAR 1219

N74-30143/3GA PC$5.50/MF$2.25
Laboratoire de Physique Theorique et Particules Elementaires, Orsay (France).
CONSTRAINTS AND GAUGE TRANSFORMATIONS.
A. Frenkel. Jun 74, 48p LPTPE-74/20

Descriptors: *Constraints, *Gauge invariance, *Transformations (Mathematics), Hamiltonian functions, Lagrange coordinates, Relativistic velocity.

For abstract, see STAR 1219

20K. Solid Mechanics

AD-785 653/7GA PC$3.25/MF$2.25
Army Construction Engineering Research Lab Champaign Ill
NUMERICAL SOLUTION OF THREE-DIMENSIONAL ELASTICITY,
E. L. Marvin, and C. P. Altheide. 1967, 13p

Descriptors: *Structural members, *Elastic properties, Boundary value problems, Computer programming, Computations.
Identifiers: Spherical harmonics.

The research reported here was undertaken to develop an alternative method for solving three-dimensional elasticity boundary value problems that might prove less expensive than the three-dimensional finite elements approach. Such a new approximate solution procedure, if successful, would also provide a means for checking the results obtained by finite elements analysis. A computer program called 3DELAS1, which may be used to solve displacement boundary value problems for generally shaped finite solids, has been developed as a part of this research.

AD-785 734/5GA PC$4.25/MF$2.25
California Univ Berkeley Structural Engineering Lab
NONLINEAR FINITE ELEMENT DYNAMIC ANALYSIS OF AXISYMMETRIC SOLIDS.
Interim rept. Jul 73-Jul 74,
S. Nagarajan, and E. P. Popov. Jul 74, 54p Rept no. UCSESM-74-9
Contract DAAA21-72-C-0727
Report on Structures and Materials Research.

Descriptors: *Solid bodies, *Loads(Forces), Axisymmetric, Static loads, Dynamic loads, Deformation, Dynamic response, Mathematical models.
Identifiers: Finite element analysis.

The subject of this investigation has been the static and dynamic analysis of axisymmetric solids taking into account both material and geometric nonlinearities. A general Lagrangian formulation forms the basis for the incremental equations of motion which are solved using direct integration methods. Solution accuracy is improved by applying equilibrium correction loads at each step. Finite element discretization is achieved through the use of quadrilateral plane stress and axisymmetric elements with incompatible modes added for improvement of the element flexural characteristics. Several numerical examples are presented to demonstrate the effectiveness of the developed computer program. (Author)

AD-785 914/3GA PC$5.25/MF$2.25
Massachusetts Univ Amherst School of Engineering
INFLUENCE OF SHEAR ON NON-LINEAR BEHAVIOR OF AN ORTHOTROPIC THIN SHALLOW RECTANGULAR PANEL,
Technical rept.,
Pei-Kao Hsueh, and William A. Nash. Jul 74, 103p Rept no. UM-74-2
Contract N00014-68-A-0146

Descriptors: *Elastic shells, *Panels, *Buckling, Shells(Structural forms), Loads(Forces), Finite difference theory, Computer programs, FORTRAN.
Identifiers: Snap through buckling.

Using the energy method and a variational theorem, a set of force equilibrium differential equations as well as the required natural boundary conditions for an orthotropic shallow rectangular panel acting in the non-linear large deflection range with a consideration of transverse shear deformation effects have been derived. A systematic numerical approach is developed to solve these equations. The numerical solutions are obtained by using the finite difference approximation to form the finite difference equations and then the Newton-Raphson iteration scheme is employed to solve this system of nonlinear simultaneous algebraic equations. Detail has been given as to the application of the procedures developed to different load and support conditions for given shallow shell geometries. Snap-through buckling loads for spherical panels with a rectangular planform base have been computed for a wide range of shell geometries for both isotropic and orthotropic materials. Snap-through buckling loads for cylindrical panels are also demonstrated to show the broad capability of the computer program. (Modified author abstract)

AD-785 925/9GA Reprint
Biot (Maurice A) Brussels (Belgium)
THERMOELASTIC BUCKLING. AN UNSTABLE THERMODYNAMIC EQUILIBRIUM AT MINIMUM ENTROPY.
Interim rept.,
Maurice A. Biot. 1974, 29p AFOSR-TR-74-1489
Contract F44620-71-C-0092
Availability: Pub. in Jnl. of Royal Academy of Belgium Bull., v70 n5 p116-140 1974.

Descriptors: *Materials, *Buckling, Thermal properties, Elastic properties, Entropy, Partial differential equations, Belgium.
Identifiers: *Thermoelasticity.

The instability of thermodynamic equilibrium of a system in a state of minimum entropy is analyzed by treating the particular example of thermoelastic buckling of a thin elastic plate in an initial state of compression in its own plane. There are two critical buckling loads, one for slow isothermal deformation, the other for fast adiabatic deformation. For an intermediate load the buckling occurs at a finite rate controlled by the thermal conductivity of the elastic material. Thus a purely thermoelastic creep buckling is obtained. The general analysis is based on Lagrangian thermodynamics in the vicinity of an equilibrium state with initial stress. The general theory is compared with the solution derived from classical differential equations of thermoelasticity. (Modified author abstract)

AD-785 946/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
EVALUATION OF THE EFFECTS OF RESIDUAL STRESSES ON THE BRITTLE STRENGTH OF WELDED CONSTRUCTIONS WITH SURFACE DEFECTS,
G. P. Cherepanov, A. B. Kaplun, and L. P. Karasev. 3 Nov 73, 12p Rept no. FSTC-HT-23-1380-73
Trans. of Problemy Prochnosti v Mashinostroenii (USSR) n12 p30-35 1971.

Descriptors: *Shells(Structural forms), Cylindrical bodies, Welds, Defects(Materials), Brittleness, Translations, USSR.
Identifiers: *Fracture mechanics, *Cylindrical shells.

The authors derive equations which can be used to estimate the strength of cylindrical shells, taking into account their geometric parameters, residual stresses, the sizes of cracks in the metal and the breakdown toughness.

AD-785 968/9GA PC$25.2/MF$2.25
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
PROCEEDINGS OF THE CONFERENCE ON MATRIX METHODS IN STRUCTURAL MECHANICS (3RD) HELD AT WRIGHT-PATTERSON AIR FORCE BASE, OHIO ON 19-21 OCTOBER 1971,
R. M. Bader, L. Berke, R. O. Meitz, W. J. Mykytow, and J. S. Przemieniecki. Dec 73, 1021p Rept no. AFFDL-TR-71-160
See also AD-703 685.

Descriptors: *Structural mechanics, *Meetings, Structural properties, Structural response, Optimization, Structural engineering, Computer graphics.
Identifiers: Finite element analysis, Engineering design.

The Air Force Third Conference on Matrix Methods in Structural Mechanics, held at Wright-Patterson Air Force Base, Ohio on 19-21 October 1971, was sponsored jointly by the Air Force Flight Dynamics Laboratory, Air Force Institute of Technology, Air University. The purpose of the conference was to discuss the recent developments in the field of matrix methods of structural analysis and design of aerospace vehicles. The thirty-four papers presented were arranged into nine topic areas; design procedures, general methods, finite elements, dynamics, optimization, structural applications, computer graphics, nonlinear effects, and non-structural applications. (Author)

AD-785 975/4GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
A STUDY OF SINGLE-FREQUENCY OSCILLATIONS IN MECHANICAL SYSTEMS DESCRIBED BY ONE-DIMENSIONAL BOUNDARY VALUE PROBLEMS WITH NONLINEAR BOUNDARY CONDITIONS,
B. I. Moseenkov. 22 Feb 74, 18p Rept no. FSTC-HT-23-1645-73
Trans. of Primenenie Teorii Nalineinkh Kolebanii v Makhanike (USSR) v3 p478-492 1970.

Descriptors: *Mechanical energy, *Boundary value problems, Oscillation, Elastic properties, Partial differential equations, Translations, USSR.

In the study of single-frequency oscillations the technique of constructing the appropriate solutions is developed for one-dimensional mixed and boundary value problems described by the quasiwave equation with two non-linear boundary conditions. The asymptotic methods of N. N. Bogolyubov and Y. A. Mitropolskiy are extended to the class of problems mentioned above. This technique can be applied with some modifications to the study of single-frequency regimes of stationary and non-stationary rod oscillations, for which the corresponding boundary value problems may contain, in the general case, four quasilinear boundary conditions.

AD-785 981/2GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
SOME INVERSE PROBLEMS IN THE FLEXURE OF ORTHOTROPIC SLOPING SHELLS,
N. S. Ganiev. 19 Feb 74, 10p Rept no. FSTC-HT-23-1646-73
Trans. from Vsesoyuznaya Konferentsiya po Teorii Plastin i Obolochek (7th). Trudy (USSR) 1969.

Descriptors: *Shells(Structural forms), *Loads(Forces), Differential equations, Translations, USSR.

The article considers the solution of inverse boundary value problems in nonlinear theory for orthotropic sloping shells.

AD-785 993/7GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
INVESTIGATION OF THE REACTION OF A SPHERICAL SHELL TO POWER AND THERMAL SHOCK.
Yu. G. Korotkikh, and Ay. I. Ruzanov. 16 Sep 74, 18p Rept no. FTD-MT-24-1602-74
Edited machine trans. of Gorkovskii Gosudarstvennyi Universitet. Uchenye Zapiski (USSR) n134 p91-102 1971, by Frank C. Vaughn.

Descriptors: *Shells(Structural forms), *Spheres, *Shock, Thermal shock, Loads(Forces), Dynamic response, Translations, USSR.
Identifiers: *Spherical shells.

The report is devoted to the analysis of processes, which occur in a spherical aluminum shell during two types of dynamic effects: the power pulse effect and the thermal effect.

AD-786 043/0GA PC$5.75/MF$2.25
Technion - Israel Inst of Tech Haifa Dept of Aeronautical Engineering
GENERAL TRANSIENT SOLUTION METHOD FOR THE ENTIRE SUDDEN DEFORMATION DOMAIN OF TWO-DIMENSIONAL SOLIDS.
Final rept.,
Moche Ziv. Mar 74, 150p Rept no. TAE-204
AFOSR-74-1502
Grant AF-AFOSR-2330-72

Descriptors: *Solids, *Deformation, Kinematics, Loads(Forces), Cavities, Stress waves, Boundary value problems, Computer programs.

New avenues of approach are presented for the overwhelming task of ascertaining the multi-dimensional transient deformation of solids. Waves emanate from impulsive sources and their reflections from boundaries map a strong discontinuity region into the solid. The region is comprised of longitudinal, shear, and head waves, all of which are revealed in the solution by the new method. Two main programs constitute the method: an analytical formulation which is the dominating base, and a numerical integration technique. The analytical part is a kinematical approach, therefore valid for any field equations. It consists of superimposing compatible kinematical relations, existing across strong discontinuity surfaces, on the multi-dimensional theory of characteristics. The dynamical part is constructed of a wave grid and the integration along these paths is carried out numerically via the finite-difference technique. (Modified author abstract)

AD-786 076/0GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
SECONDARY BUCKLING OF CIRCULAR PLATES.
Edward L. Reiss, and L. S. Cheo. 26 Feb 73, 8p
Rept no. NYU-ONR-H50
Contract N00014-67-A-0467-0006, Grant NSF-GP-27223
Prepared in cooperation with William Paterson Coll. of New Jersey, Wayne.
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v26 n3 p490-495 May 74.

Descriptors: *Plates, *Buckling, Circular, Loads(Forces), Compressive properties, Stresses, Dynamic response.
Identifiers: Clamped plates.

It is shown by using a formal perturbation expansion, that unsymmetric equilibrium states branch from axisymmetric buckled states of the uniformly compressed and clamped circular plate. The process is called secondary buckling and the edge thrusts at which the branchings occur are called the secondary buckling loads. In the neighborhoods of the secondary buckling loads that are studied, the secondary states exist for thrusts less than the secondary buckling loads. The minimum secondary buckling load is approximately 7.5 times the primary buckling load of the plate. The linear boundary value problems that are obtained in the application of the perturbation method are solved numerically. (Author)

LA-5599-MS PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
TSAAS: FINITE ELEMENT THERMAL AND STRESS ANALYSIS OF AXISYMMETRIC SOLIDS WITH ORTHOTROPIC TEMPERATURE-DEPENDENT MATERIAL PROPERTIES.
R. V. Browning, D. G. Miller, and C. A. Anderson. May 74, 52p
Contract W-7405-eng-36

Descriptors: (*Solids, *Stress analysis), Axial symmetry, Finite element method, Mechanical properties, Strains, Stresses, Temperature dependence, Thermal analysis, Thermodynamic properties.

For abstract, see NSA 30 08, number 23418.

LA-5621-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
PLACID: A GENERAL FINITE-ELEMENT COMPUTER PROGRAM FOR STRESS ANALYSIS OF PLANE AND AXISYMMETRIC SOLIDS.
R. G. Lawton. May 74, 33p
Contract W-7405-eng-36

Descriptors: (*Stress analysis, Computer codes), (*Computer codes, *P codes), Axial symmetry, Finite element method, Geometry, Mechanical properties, Solids.

For abstract, see NSA 30 08, number 23318.

N74-30328/0GA PC$8.00/MF$2.25
Technische Universitaet, Brunswick (West Germany).
CALCULATION ON SHELL FRAMEWORKS WITH CURVED GRID ELEMENTS BERECHUNG VON SCHALENTRAGWERKEN MIT GEKRUEMMTEN GITTEROSTELEMENTEN.
Ph.D. Thesis.
D. Born. 1972, 97p
Language in German.

Descriptors: *Matrices (Mathematics), *Shells (Structural forms), *Topology, Analytic geometry, Curvature, Frames, Profiles, Structural analysis.

For abstract, see STAR 1219

N74-30329/8GA PC$17.25/MF$2.25
Princeton Univ., N.J. Aeroelastic and Magnetoelastic Lab.
ANALYSIS OF COMPLEX ELASTIC STRUCTURES BY A RAYLEIGH-RITZ COMPONENT MODES METHOD USING LAGRANGE MULTIPLIERS.
Ph.D. Thesis.
L. R. Klein. Apr 74, 284p NASA-CR-138942, AMS-1159
Contract NGL-31-001-146

Descriptors: *Elastic properties, *Lagrange multipliers, *Rayleigh-ritz method, *Structural analysis, Aircraft structures, Beams (Supports), Continuity (Mathematics), Free vibration, Modal response, Plates (Structural members).

For abstract, see STAR 1219

N74-30330/6GA PC$7.75/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
CREEP BUCKLING IN VISCOELASTIC CIRCULAR CYLINDRICAL SHELLS UNDER AXIAL PRESSURE KRIECHBEULEN VISKOELASTISCHER KREISZYLINDERSCHALEN UNTER AXIALDRUCK.
Ph.D. Thesis.
1973, 91p
Language in German.

Descriptors: *Axial loads, *Creep buckling, *Cylindrical shells, Numerical analysis, Polyethylenes, Thin walled shells, Viscoelastic cylinders.

For abstract, see STAR 1219

N74-30331/4GA PC$8.50/MF$2.25
Technische Hochschule, Darmstadt (West Germany).
APPLICATION OF AN INTEGRAL METHOD FOR CALCULATING ELASTIC PLATES WITH STATIC OR GEOMETRIC BOUNDARY CONDITIONS UNDER THE EFFECTS OF RANDOM EDGE- OR INTERIOR-LOADS ANWENDUNG EINES INTEGRALVERFAHRENS AUF DIE BERECHNUNG ELASTISCHER SCHEIBEN MIT STATISCHEN ODER GEOMETRISCHEN RANDBEDINGUNGEN UNTER DER EINWIRKUNG BELIEBIGER RAND- ODER INNENLASTEN.
H. Friemann. 1973, 107p
Language in German.

Descriptors: *Boundary value problems, *Edge loading, *Elastic plates, *Integral equations, Approximation, Integral transformations, Plate theory, Residual stress, Torsional stress.

For abstract, see STAR 1219

N74-30332/2GA PC$5.25/MF$2.25
Cranfield Inst. of Technology (England). College of Aeronautics.
APPLICATION OF THE FOKKER-PLANCK EQUATION TO RANDOM VIBRATION OF NONLINEAR SYSTEMS.
C. L. Kirk. Apr 74, 45p CRANFIELD-AERO-20

Descriptors: *Fokker-planck equation, *Nonlinear systems, *Random vibration, *Vibration effects, *Vibration measurement, Degrees of freedom, Fatigue (Materials), Life (Durability), Probability density functions, Systems analysis, Vibration damping.

For abstract, see STAR 1219

N74-30336/3GA PC$9.25/MF$2.25
Cincinnati Univ., Ohio.
STRESS TESTS ON CYLINDERS AND ALUMINUM PANELS.
Final Report, 1 Aug. 1973 - 31 Jul. 1974.
L. H. Sobel, and B. L. Agarwal. 31 Jul 74, 125p
NASA-CR-139215
Contract NGR-36-004-065

Descriptors: *Buckling, *Composite materials, *Cylindrical shells, *Mechanical properties, Mathematical models, Numerical analysis, Optimization, Orthotropic cylinders.

For abstract, see STAR 1219

N74-30337/1GA PC$4.50/MF$2.25
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Engineering Science and Mechanics.
STRESS INTENSITY FACTORS FOR DEEP-CRACKS EMANATING FROM THE CORNER FORMED BY A HOLE INTERSECTING A PLATE SURFACE.
J. J. Mcgowman, and C. W. Smith. Apr 74, 28p
NASA-CR-132484, VPI-E-74-1
Contract NGR-47-004-076

Descriptors: *Crack propagation, *Plates (Structural members), *Stress analysis, *Stress concentration, Hole distribution (Mechanics), Mechanical properties, Photoelastic analysis.

For abstract, see STAR 1219

N74-30339/7GA PC$5.00/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y. Research Dept.
APPLICATION OF A SUBSTRUCTURING TECHNIQUE TO THE PROBLEM OF CRACK EXTENSION AND CLOSURE.
H. Armen, Jr.. Jul 74, 40p NASA-CR-132458, RE-480
Contract NAS1-12198

Descriptors: *Crack initiation, *Cyclic loads, *Elastic media, *Finite element method, *Stress analysis, *Structural analysis, Fatigue (Materials), Mathematical models, Stress analysis, Structural stability.

For abstract, see STAR 1219

N74-30436/1GA PC$5.75/MF$2.25
Institut Franco-Allemand de Recherches, St. Louis (France).
DAMAGE THRESHOLD FOR LIGHT WALLS UNDER SINGLE OR REPEATED SONIC BOOMS, PART 2 DETERMINATION DU SEUIL D'ENDOMMAGEMENT DE CLOISONS LEGERES EXPOSEES A DES BANGS UNITAIRES OU REPETES, 2 EME PARTIE.
C. H. Johe, J. P. Thybaut, and R. Hunkler. 4 Apr 73, 51p ISL-11/73
Contract DRME-72/184
Language in French.

Descriptors: *Fatigue tests, *Sonic booms, *Stiffness, *Time dependence, *Walls, Crack initiation, Crack propagation, Graphs (Charts), Thresholds.

For abstract, see STAR 1220

N74-31356/0GA PC$9.00/MF$2.25
Technische Universitaet, Munich (West Germany).
SERVICE LIFE PREDICTION FOR OSCILLATING LOADED SHARPLY NOTCHED CONSTRUCTION MEMBERS USING FRACTURE MECHANICS LEBENSDAUERVORHERSAGE SCHWINGEND BEANSPRUCHTER SCHARF GEKERBTER BAUTEILE AUF DER GRUNDLAGE DER BRUCHMECHANIK.
Ph.D. Thesis.
R. Wagner. 30 Jul 73, 119p
Language in German.

Descriptors: *Fracture strength, *Notch strength, *Rods, *Service life, Cyclic loads, Elastoplasticity, Performance prediction, Stress concentration.

For abstract, see STAR 1220

PB-235 305/0GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Dept. of Computer Science.
MECHANICAL VIBRATION TREES.
Final rept.,
Joseph Genin, and John S. Maybee. Aug 73, 29p
CU-CS-029-73
Grant NSF-GJ-660
Prepared in cooperation with Purdue Univ., Lafayette, Ind. School of Mechanical Engineering.

Descriptors: *Vibration, *Matrices(Mathematics), *Trees(Mathematics), Inequalities, Eigenvectors, Theorems.

The purpose of this paper is to develop a chapter in the theory of the small vibrations of mechanical systems which is the consequence of some recent work in matrix theory.

SLA-74-9 PC$11.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
SWAP-9: AN IMPROVED STRESS WAVE ANALYZING PROGRAM.
L. M. Barker, and E. G. Young. Jun 74, 174p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *S codes), (*Solids, *Evaporation), Detonations, Elasticity, Gases, Mechanical properties, One-dimensional calculations, Programming, Shock waves, Spallation, Strains, Stress analysis, Tensile properties, Yield strength.

For abstract, see NSA 30 08, number 23426.

TRG-Report-2504(R) PC$4.00/MF$2.25
UKAEA Reactor Group, Risley.
SIMPLE TRIANGULAR MEMBRANE FINITE ELEMENT.
J. P. Ellington. Apr 74, 11p
U.S. Sales Only.

Descriptors: (*Stress analysis, *Finite element method), (*Mechanical structures, Stress analysis), Strains.

For abstract, see NSA 30 08, number 20931.

UCID-16541 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
ELASTIC--PLASTIC STRESS--STRAIN RELATIONS USED IN CODE EPSOLA.
M. Hartzman. 20 Apr 73, 15p
Contract W-7405-Eng-48

Descriptors: Computer codes, E codes, Elasticity, Equations, Finite element method, Mathematics, Mechanical properties, Plasticity, Programming, Strains, Stresses.

For abstract, see NSA 30 08, number 23488.

20L. Solid-State Physics

AD-785 608/1GA PC$3.25/MF$2.25
Harry Diamond Labs Washington D C
LARGE POLARIZATION DEPENDENT VOLTAGES IN FERROELECTRIC CERAMICS,
Philip S. Brody, and Frank Crowne. 1973, 12p

Descriptors: *Ferroelectric materials, *Photovoltaic effect, High voltage, Polarization, Solar energy, Ceramic materials.

This paper describes a new high-voltage photovoltaic effect appearing in ferroelectric ceramics. A thin ceramic wafer illuminated uniformly produces a steady voltage across electrodes on the wafer edge. This is a new effect with possible applications. This effect could be used to produce very high voltages in a relatively uncomplicated fashion. Of greater importance, perhaps, is a possible potential for direct solar-to-electric energy conversion, although this would necessitate finding a material with considerably greater photovoltaic efficiencies over broader spectral regions.

AD-785 652/9GA PC$3.25/MF$2.25
Army Construction Engineering Research Lab Champaign Ill
A GENERALIZED KINEMATIC HARDENING THEORY,
E. L. McDowell. 1973, 16p

Descriptors: *Hardening, *Stresses, *Fatigue(Mechanics), Life expectancy, Mathematical models.

The influence of inelastic behavior of materials ranges from the design of structures to survive earthquake motions to the design of minute machine parts for a specified expected service life. The scope of the present paper is limited to generalizing simple kinematic hardening theory so as to directly attack the question of fatigue life for realistic time-dependent three-dimensional stress states. This new theory of kinematic plastic flow defines an additional physical parameter, the stress hardening coefficient, which services as memory of the previous plastic states. For a specified material, the limiting value of the stress hardening coefficient can be determined from simple one-dimensional fatigue experiments. This limiting value of the stress hardening coefficient directly determines the service life for the material subjected to complex stress states.

AD-785 663/6GA PC$3.25/MF$2.25
Picatinny Arsenal Dover N J Feltman Research Labs
CORRELATION OF THE VIBRATIONS OF MOLECULES AND STABILITY IN ENERGETIC MATERIALS.
Henry J. Prask, Chang S. Choi, Zafar Iqbal, and Samuel F. Trevino. 1974, 16p

Descriptors: *Azides, *Ammonium perchlorate, *Stability, Solid propellants, Phase studies, Crystal structure, Molecular vibration, Crystal lattices, Anharmonic oscillators.
Identifiers: *Ammonium nitrate, *Lattice dynamics, Lattice vibrations.

The paper represents implementation and refinement of the capabilities required to characterize fundamental processes in energetic materials. In particular, attention is focused on the correlation of interatomic forces and physical and chemical instability as manifested by changes in the dynamics of molecular groups in ammonium nitrate, ammonium perchlorate and the metal-azide salts. Results for the compounds are preceded by a discussion of experimental techniques including that of quasi-elastic neutron scattering which has not previously been employed for energetic materials. A brief introduction to the theory of lattice or molecular dynamics is also presented.

AD-785 709/7GA Not available NTIS
National Research Council of Canada Ottawa (Ontario)
PERTURBATION THEORY OF ANHARMONIC CRYSTALS,
T. H. K. Barron, and M. L. Klein. 1974, 60p Rept no. NRC-13768
Prepared in cooperation with Bristol Univ. (England). Dept. of Theoretical Chemistry.
Availability: Pub. in Dynamical Properties of Solids, p392-449 1974.

Descriptors: *Crystal lattices, *Perturbation theory, Quantum theory, Thermal properties, Green's function, Dielectric properties, Phonons, Stress waves, Tensor analysis, Canada.
Identifiers: Lattice vibrations.

Contents:
Helmholtz energy--classical theory;
Helmholtz energy--quantum theory;
Stress tensor and elastic constants--thermal expansion;
Green functions, correlation functions, and the dielectric and scattering properties of crystals.

AD-785 712/1GA PC$3.25/MF$2.25
Army Electronics Command Fort Monmouth N J
OPTIMIZATION OF SINGLE PARTICLE ABSORPTION CROSS SECTION,
Kenneth Bardall. Aug 74, 16p Rept no. ECOM-4248

Descriptors: *Absorption cross sections, *Magnetic materials, Microwaves, Dielectrics, Graphite, Tungsten, Aluminum, Gold, Copper.

The single particle absorption cross section is maximized with respect to the imaginary component of permittivity, separately, by means of elementary calculus. This optimization yields rela-

tionships between the aspect ratio and the real and imaginary parts of permeability and permittivity for the single particles. The significance of this optimization is discussed for the magnetic spherical and cylindrical particle cases and for the dielectric spherical and cylindrical particle cases. The effect of this maximization on the single particle scattering cross section and the minimization of the latter cross section are presented. (Modified author abstract)

AD-785 744/4GA Reprint
Louvain Univ (Belgium) Centre de Psychologie Experimentale Et Comparee
THEORY OF SURFACE FORCE CONSTANT CHANGES IN BODY-CENTERED CUBIC LATTICES.
Final rept.,
D. J. Cheng, R. F. Wallis, and L. Dobrzynski. 8 Nov 73, 20p Rept no. TR-73-42
Contract N00014-69-A-0200-9003
Availability: Pub. in Surface Science, v43 p400-416 1974.

Descriptors: *Surfaces, *Crystal lattices, Phonons, Brillouin zones, Equations of motion, Chromium, Iron, Tungsten, Molybdenum.
Identifiers: *Cubic lattices.

A calculation has been made of force-constant changes at the (100) and (110) surfaces of body-centered cubic crystals. A model consisting of first, second and third-neighbor Lennard-Jones interactions together with harmonic angle-bending interactions is employed. The parameters characterizing the interactions are chosen to fit the equilibrium lattice spacing, the elastic constants, and certain phonon frequencies at high symmetry points in the Brillouin zone. The procedure consists of first calculating the static displacements produced by the creation of the surface and then calculating the change in force constants produced by the cubic and quartic anharmonic terms in the potential energy. Specific results have been obtained for chromium, iron, tungsten, and molybdenum. (Author)

AD-785 757/6GA Reprint
Pittsburgh Univ Pa Dept of Chemistry
HEAT CAPACITIES AND RELATED THERMAL PROPERTIES OF DYNI5, HONI5 AND ERNI5 BETWEEN 5 AND 300K,
S. G. Sankar, D. A. Keller, R. S. Craig, W. E. Wallace, and V. U. S. Rao. 24 Apr 73, 9p AROD-5375.17-MC
Grant DA-ARO-D-31-124-71-G74
Availability: Pub. in Jnl. of Solid State Chemistry, v9 p78-84 1974.

Descriptors: *Specific heat, *Rare earth compounds, Crystal lattices, Entropy, Magnetic properties, Dysprosium compounds, Entropy, Holmium compounds, Erbium compounds, Nickel compounds, Molecular energy levels.
Identifiers: *Thermodynamic properties, Nickel intermetallics.

Heat capacity data and calculated thermodynamic functions are presented for DyNi5, HoNi5 and ErNi5. Lamda-type thermal anomalies are noted at 12.0K (DyNi5), 4.1K (HoNi5) and 8.0K (ErNi5). Schottky-type anomalies are observed at higher temperatures. Anomalies are ascribed to the destruction of ferromagnetic order and to crystal field excitation. A deficiency of magnetic entropy is noted. This suggests that the ground state in the ordered materials is a doublet. ErNi5 is analyzed using a Hamiltonian containing terms representing the crystal field and magnetic interactions. The analysis shows that a doublet ground state can result with reasonable values of the crystal field parameters. The parameters are shown to be consistent with the heat capacity behavior of ErNi5. Ordering temperatures are not proportional to the de Gennes function. (Modified author abstract)

AD-785 758/4GA Reprint
Pittsburgh Univ Pa Dept of Chemistry
EXPERIMENTAL EVIDENCE FOR THE FORMATION OF A SINGLET GROUND STATE AT LOW TEMPERATURES IN THE DENSE KONDO SYSTEM CEAL3,
J. V. Mahoney, V. U. S. Rao, W. E. Wallace, and R. S. Craig. 30 Mar 73, 6p AROD-5375.24-MC
Grant DA-ARO-D-31-124-71-G74
Prepared in cooperation with Los Alamos Scientific Lab., N. Mex.
Availability: Pub. in Physical Review B, v9 n1 p154-157, 1 Jan 74.

Descriptors: *Specific heat, *Cerium compounds, *Lanthanum compounds, Temperature, Ground state, Entropy, Cryogenics.
Identifiers: *Aluminides, Kondo effect.

Heat-capacity measurements have been performed on CeAl3 and LaAl3 between 1.8 and 300 K. The difference in the heat capacities of these two compounds has been regarded as the additional contribution due to the local moments on Ce(3+) (J = 5/2) in CeAl3. The heat capacity difference vs T curve displays two pronounced anomalies peaking near 5 and 25 K. The total entropy under this curve is nearly R ln6 which is in excess of the maximum possible crystal-field entropy by R ln2. Neutron-diffraction measurements, show that the lower-temperature heat-capacity anomaly is not caused by magnetic ordering in CeAl3. The results have therefore been interpreted on the basis of the combined effects of crystal-field splitting and the Kondo effect on the Ce(3+) ions. Analysis of the measured entropy leads to the conclusion that the low-temperature ground state in this Kondo system is a spin- and orbit-compensated singlet, in accord with recent theoretical predictions. (Modified author abatract)

AD-785 769/1GA Reprint
California Univ Santa Barbara Dept of Physics
TRANSPORT PROPERTIES OF NONEQUILIBRIUM SUPERCONDUCTORS,
Jhy-Jiun Chang, and D. J. Scalapino. 31 Jan 74, 8p AROD-10409.7-P
Grant DA-ARO-D-31-124-72-G74
Availability: Pub. in Physical Review B, v9 n11 p4769-4774, 1 Jun 74.

Descriptors: *Superconductors, Transport properties, Phonons, Nuclear spins.

The model developed by Owen and Scalapino for superconductors with excess quasiparticles at thermal equilibrium with the lattice was adapted to investigate the transport properties of the nonequilibrium superconductors. Specifically, the authors have calculated within this model the frequency and temperature dependence of the ultrasonic-attenuation coefficient, the dynamic electric conductivity, and the temperature dependence of the nuclear-spin relaxation time. It is found that in some cases even a small number of excess quasiparticles can change the transport property drastically. (Author)

AD-785 814/5GA Reprint
IBM Thomas J Watson Research Center Yorktown Heights N Y
RESONANT TUNNELING IN SEMICONDUCTOR DOUBLE BARRIERS,
L. L. Chang, L. Esaki, and R. Tsu. 18 Mar 74, 5p AROD-11574.8-P
Contract DAHC04-74-C-0012
Availability: Pub. in Applied Physics Letters, v24 n12 p593-595, 15 Jun 74.

Descriptors: *Gallium arsenides, *Tunneling(Electronics), Semiconductor devices, Epitaxial growth, Resonance.

Resonant tunneling of electrons has been observed in double-barrier structures having a thin GaAs sandwiched between two GaAlAs barriers. The resonance manifests itself as peaks or humps in the tunneling current at voltages near the quasistationary states of the potential well. The structures have been fabricated by molecular beam epitaxy which produces extremely smooth films and interfaces. (Author)

AD-785 870/7GA PC$3.25/MF$2.25
California Univ Irvine Dept of Physics
THEORY OF PSEUDOSURFACE POLARITONS IN SEMICONDUCTORS IN MAGNETIC FIELDS.
Final rept.,
J. J. Brion, and R. F. Wallis. Jun 74, 14p Rept no. TR-74-7
Contract N00014-69-A-0200-9003

Descriptors: *Semiconductor devices, Surfaces, Magnetic fields, Maxwells equations, Dispersion relations.
Identifiers: *Polaritons.

A theoretical discussion is presented of pseudosurface polaritons associated with magnetoplasmons in a semi-infinite sample of a semiconductor. The dispersion curve, electric field ratios and attentuation constants connect smoothly to the corresponding quantities outside of the pseudosurface wave region. The geometrical configuration of magnetic field perpendicular to the surface and arbitrary wave vector direction is discussed. A comparison is made of the dispersion relation of pseudosurface polaritons with that of surface polaritons outside of the pseudosurface wave region. (Author)

AD-785 881/4GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
STUDY OF THE DIFFUSION OF ANTIMONY IN BISMUTH TELLURIDE SINGLE CRYSTALS AS A FUNCTION OF THE COMPOSITION,
A. A. Bekker, A. N. Krestovnikov, A. N. Nesmeyanov, L. M. Romantseva, and M. I. Tsypin. 22 Feb 74, 6p Rept no. FSTC-HT-23-1532-73
Trans. of Moscow Univ. Vestnik. Seriya 2: Khimiya (USSR) v13 n2 p239-240 Mar/Apr 72.

Descriptors: *Diffusion, *Antimony, Bismuth compounds, Tellurides, Composition(Property), Orientation(Direction), Anisotropy, Stoichiometry, Translations, USSR.
Identifiers: *Bismuth tellurides.

Single crystals of bismuth telluride were prepared, and antimony was applied onto their surfaces by vacuum deposition. After homogenizing, the depth of penetration of the antimony into the crystals was determined by the changes in the thermo-emf along the diffusion path. The coefficient of diffusion of antimony was greatest for nearly stoichiometric compositions. The diffusion of antimony in two mutually perpendicular directions with respect to the basal plane had a considerable anisotropy, the magnitude of which was greatest in the p-type specimens.

AD-785 941/6GA Reprint
University of Southern California Los Angeles Electronic Sciences Lab
EXPERIMENTAL STUDY OF THE FERMI SURFACE OF VANADIUM,
Robert D. Parker, and Michael H. Halloran. 6 Feb 74, 10p AFOSR-TR-74-1490
Contract F44620-71-C-0067
Availability: Pub. in Physical Review B, v9 n10 p4130-4137, 15 May 74.

Descriptors: *Vanadium, *Fermi surfaces, Microstructure.

The Fermi surface of vanadium has been studied experimentally using magnetothermal-oscillation techniques in the (100) and (110) planes in fields of 7-11 T. The Fermi surface has qualitatively the same topology as those of tantalum and niobium: a set of six distorted ellipsoidal surfaces centered at N in the Brillioun zone, and a multiply connected jungle-gym surface consisting of interconnecting arms along the (100) directions with intersections

at Gamma and H. The data, are qualitatively consistent with recent augmented-plane-wave (APW) calculations, and agree excellently with previous experimental data. (Modified author abstract)

AD-785 992/9GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
CHANGES OF THE PHOTOELECTRIC PROPERTIES OF CADMIUM SELENIDE EVAPORATED FILMS DURING ACTIVATION,
S. Svechnikov. 3 Oct 73, 8p Rept no. FSTC-HT-23-1291-73
Trans. of Ukrainskii Fizicheskii Zhurnal (USSR) n17 n1 p106-109 1972.

Descriptors: *Cadmium selenides, *Photoconductivity, Semiconducting films, Annealing, Crystal structure, Translations, USSR.

When activating CdSe films by means of diffusion annealing two processes are observed: (a) a sharp increase in the dark resistance during the first 30 min. and (b) a slower change during subsequent annealing during the subsequent 20 hr. A change in resistance during the first process is related to the decrease in concentration of the electrons on the donor admixtures with an activation energy of 0.6-0.7 ev. The mobility of carriers of photoelectric effect at a temperature close to room temperature or higher is on the same order of magnitude as the mobility in monocrystals. The depth of occurrence and the concentration of the adhesion levels are partically invariable during the activation process.

AD-786 031/5GA PC$4.25/MF$2.25
Carborundum Co Niagara Falls N Y Research and Development Div
PREPARATION AND PROPERTIES OF FINE DIAMETER MULTIFILAMENT NIOBIUM CARBONITRIDE SUPER-CONDUCTING FIBERS.
Final technical rept. 1 Apr 73-31 Mar 74,
Ruey Y. Lin, William D. Smith, John Coppola, and James Economy. Jun 74, 73p AFML-TR-74-113
Contract F33615-73-C-5110

Descriptors: *Niobium compounds, *Yarns, *Superconductors, Fibers, Fabrication, Doping, Silicon, Copper, Coatings.
Identifiers: Niobium carbonitrides, Niobium chlorides, Critical temperature.

This report summarizes the development efforts on niobium carbonitride yarn. The preparation was accomplished by reacting the carbon fiber precursor with niobium pentachloride in the presence of hydrogen and nitrogen at 1500 to 1600C for 2 to 6 minutes. The reacted yarn was quenched from the reaction temperature to about 200C to retain the niobium carbonitride phase. These fibers display excellent superconducting properties. A post treatment with ammonia was found to cause a composition change yielding a nitrogen rich product via a further nitriding process. The critical current and current density of the typical products were increased. Silicon dopant was found to be effective in improving the critical current at high magnetic fields. Improvement in electrical contact between the superconductor and copper coating was accomplished by a post coating heat treatment in the temperature range of 600 to 1000C in the inert atmosphere. (Modified author abstract)

AD-786 078/6GA Reprint
IBM Thomas J Watson Research Center Yorktown Heights N Y
GA(1-X)AL(X)AS SUPERLATTICES PROFILED BY AUGER ELECTRON SPECTROSCOPY,
R. Ludeke, L. Esaki, and L. L. Chang. 21 Dec 73, 5p AROD-11574.3-P
Contract DAHC04-74-C-0012
Availability: Pub. in Applied Physics Letters, v24 n9 p417-419, 1 May 74.

Descriptors: *Gallium arsenides, *Auger electron spectroscopy, Aluminum compounds, Photoconductivity, Molecular structure, Epitaxial growth, Semiconductors.
Identifiers: Gallium aluminum arsenides, *Superlattices.

Superlattice structures made by molecular beam epitaxy are profiled by a combined technique of argon sputter etching and Auger electron spectroscopy. The superlattice, consisting of periodic layers of 50-A GaAs and Ga(1-x)Al(x)As probably represents the structure with the shortest period ever made and analyzed in monocrystalline semiconductors. Also established is the dependence of the intensity ratio of aluminum to arsenic signals of Auger transitions on the aluminum composition in Ga(1-x)Al(x)As.

AD-786 089/3GA Reprint
State Univ of New York Stony Brook Dept of Materials Science
ON THE QUESTION OF SPINODAL DECOMPOSITION IN ALKALI HALIDE MIXED CRYSTALS,
Carol Jantzen, and Herbert Herman. 13 Dec 73, 6p AROD-8571.7-MC
Grant DA-ARO-D-31-124-73-G169
Availability: Pub. in Jnl. of Physics D Applied Physics, v7 pL45-L48 1974.

Descriptors: *Sodium chloride, Phase studies, Solid solutions, Crystal lattices.
Identifiers: *Spinodal decomposition, *Potassium chloride, *Lattice parameters.

In the solid-solution system NaCl-KCl there is a mismatch of the lattice parameters of the end members of greater than 10%. The strain energy which is generated by this mismatch depresses the maximum spinodal temperature to well below ambient temperature. This maximum temperature for the coherent spinodal is calculated to be - 148C. This calculated depression does not agree with those previously calculated, but does agree with all of the available experimental data. (Author)

AD-786 102/4GA Reprint
Florida Univ Gainesville Dept of Materials Science and Engineering
PROPERTIES OF MOLYBDENUM FILMS PREPARED BY DECOMPOSITION OF THE CARBONYL,
A. I. DeRosa, D. B. Dove, and R. E. Loehman. 12 Jul 73, 4p AROD-8993.8-P
Contract DAHC04-70-C-0024
Availability: Pub. in Jnl. of Vacuum Science and Technology, v11 n1 p455-457 Jan/Feb 74.

Descriptors: *Metal films, *Molybdenum, Amorphous materials, Electrodes, Metal carbonyls, Pyrolysis, X ray diffraction, Electron diffraction, Microstructure, Semiconductors.
Identifiers: Amorphous semiconductors.

Results of research directed toward preparation of refractory metal electrodes for amorphous chalcogenide semiconductors are presented. Mo(CO)6 vapor in Ar carrier gas was pyrolytically decomposed at temperatures below 250C to form a low-resistance metallic coating on selected substrates. X-ray and electron diffraction experiments indicated these films are amorphous. Heat treatment for 15 min at 865C promoted crystallization of the deposits; x-ray analysis then showed the presence of Mo and Mo2C in a 2:1 ratio. Masking techniques to produce particular electrode configurations were only partially successful; however, a photolithographic method produced electrodes completely satisfactory for electrical-properties measurements. (Author)

AD-786 150/3GA Reprint
University of Southern California Los Angeles
INFRARED REFLECTION OF ION-IMPLANTED GAAS,
A. H. Kachare, W. G. Spitzer, F. K. Euler, and A. Kahan. 2 Jan 74, 11p AFCRL-TR-74-0407
Grant AF-AFOSR-2075-71
Availability: Pub. in Jnl. of Applied Physics, v45 n7 p2938-2946 Jul 74.

Descriptors: *Gallium arsenides, *Ion implantation, Infrared radiation, Radiation effects, Nitrogen, Reflectivity, Dielectric properties, Crystal structure, Optical properties, Semiconductors.

In the present study, nitrogen ions are implanted in GaAs at energies between 1 and 3 MeV. These energies are significantly larger than those used in the above-mentioned studies and correspond to projected ion ranges of several microns. The implantation-induced effect on the room-temperature infrared reflectivity, particularly in the reststrahl region, is presented. Substantial changes in reflectivity are observed and these changes are compared with simple models for changes in the dielectric constant. By using Kramers-Kronig (KK) dispersion analysis, classical dispersion (CD) analysis, and a CD-based layer model, numerical values for the dispersion parameters are obtained, compared, and related to the introduction of damage.

AD-786 193/3GA Reprint
California Univ Los Angeles Dept of Physics
RELATIVE INTENSITIES IN THE VIBRONIC ZEEMAN EFFECT IN CUBIC CRYSTALS,
S. P. Pollack, and R. A. Satten. 15 Oct 73, 12p AROD-2099.40-P
Grant DA-ARO-D-31-124-71-G67
Revision of report dated 30 Aug 72.
Availability: Pub. in Physical Review B, v9 n11 p4628-4637, 1 Jun 74.

Descriptors: *Zeeman effect, Crystals, Electronic states, Polarization, Cesium compounds, Uranium compounds, Zirconium compounds, Bromides, Chlorides.
Identifiers: Lattice dynamics, *Lattice vibrations, Crystal fields, Circular polarization.

Vibronic Zeeman intensity ratios are predicted for circularly polarized light propagation parallel to an externally applied magnetic field along (100) and (111) directions. A unique relative-intensity pattern is predicted for each type of site-symmetry vibration appearing in vibronic Zeeman patterns involving T1g or T2g electronic states. Experimental results in fields up to 62.8 kOe show semiquantitative agreement in most cases with predicted results for the ideal case of a limiting approximation in which T1u and T2u, etc., site-symmetry vibrations are not degenerate. Measurements of the departure from the limiting ratios can lead to the determination of the relative contribution of degenerate T1u, T2u, etc., site-symmetry vibrations. Ideal vibronic intensity ratios for D3d distortion of a cubic crystal field in zero magnetic field are also presented which explain certain observed polarizations not predicted by exact vibronic selection rules. (Modified author abstract)

AD-786 197/4GA Reprint
University of Southern California Los Angeles Dept of Electrical Engineering and Materials Science
DETERMINATION OF HAFNIUM-P-TYPE SILICON SCHOTTKY BARRIER HEIGHT,
M. Beguwala, and C. R. Crowell. 1 Oct 73, 5p AROD-8792.4-EL
Grant DA-ARO-D-31-124-71-G34
Availability: Pub. in Jnl. of Applied Physics, v45 n6 p2792-2794 Jun 74.

Descriptors: *Schottky barrier devices, Hafnium, Silicon, Interfaces, Capacitance.

The Schottky barrier height for holes in hafnium (HF)-p-type silicon junctions was determined to be 0.58 plus or minus 0.02 eV by current-voltage, capacitance-voltage, and photothreshold techniques. (Modified author abstract)

AD-786 248/5GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio

ELECTRICAL CHARACTERISTICS OF ALUMINUM-IMPLANTED ZINC SELENIDE.
B. K. Shin, Y. S. Park, and D. L. Look. 22 Feb 74, 4p Rept no. ARL-74-0096
Availability: Pub. in Applied Physics Letters, v24 n8 p435-436, 1 May 74.

Descriptors: *Zinc selenides, *Ion implantation, Electrical resistivity, Annealing, Semiconductors, Aluminum.

Aluminum was implanted in ZnSe at 90 keV to a dose of 10 to the 15th power ions /sq cm at room temperature. Hall-effect and sheet-resistivity measurements were made on the samples for various annealing conditions. The implanted layer is found to be degenerate n-type. (Modified author abstract)

AD-786 257/6GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ELECTRONIC CONDUCTION,
J. M. Wimmer, and I. Bransky. 1973, 45p Rept no. ARL-74-0034
Availability: Pub. in Electrical Conductivity in Ceramics and Glass, New York, 1974 ptA ch4 p270-311.

Descriptors: *Electrical conductivity, *Glass, *Ceramic materials, *Semiconductors, Oxides, Charge carriers, Crystal structure, Transition metals, Doping, Band theory of solids.
Identifiers: Polarons.

Contents:
Theoretical forms of the drift mobility;
Charge-carrier concentration;
Experimental determination of the charge-carrier concentration and drift mobility;
Analysis of electrical-conductivity and thermal emf measurements for two types of charge carriers;
Examples in ceramic materials.

AD-786 258/4GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
X-RAY PHOTOEMISSION MEASUREMENTS OF THE VALENCE-BAND DENSITY OF STATES OF SB AND INSB.
Journal article,
C. J. Vesely, and D. L. Kingston. 24 Sep 73, 6p
Rept no. ARL-74-0039
Availability: Pub. in Physics Status Solidi (b) v61 p337-340 1974.

Descriptors: *Band theory of solids, *Antimony, *Indium antimonides, Semiconductors, Photoelectric emission, X rays, Energy levels.
Identifiers: Density of states, *Valence bands.

The valence-band density of states has been measured for both crystalline Sb and InSb by X-ray induced photoemission using 1253.6 eV K alpha X-rays of Mg. The results are compared with theoretically determined band structure and density-of-states calculations. A peak observed in the InSb curve at -6 eV is interpreted as being due mostly to s-p-like bands of the Sb. (Author)

AD-786 260/0GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ANNEALING STUDIES OF BROAD-BAND LUMINESCENCE FROM ION-IMPLANTED ZINC SELENIDE,
J. J. Santiago, J. E. Ehret, W. R. Woody, and Y. S. Park. 1972, 12p Rept no. ARL-74-0047
Availability: Pub. in Ion Implantation in Semiconductors and Other Materials, p353-362.

Descriptors: *Zinc selenides, *Luminescence, *Annealing, Doping, Ion implantation, Nitrogen, Argon, Bromine, Spectrum analysis, Emission spectra, Light emitting diodes.
Identifiers: Electroluminescent diodes.

Broad-band luminescence from ion-implanted ZnSe samples was measured as a function of isochronal annealing. Samples were implanted at room temperature with N, Br, or Ar ions. One conspicuous band, in the general location of 5400 A, appears as a result of annealing to 130C. The other broad band in the spectra is located at 6400 A and is attributed to Se vacancies. The green (5400-A) band disappears after heat treatment of the samples in molten Zn at 960C. This emission is attributed to Zn vacancies. Strong complexing of V(Zn) with Br(Se) and N(Se) is deduced from the wavelength shift of the peaks of the emission bands. Some enhancement of the 5400-A band intensity is observed upon implantation with Ar. (Author)

AD-786 280/8GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
SHARP-LINE AND BROAD-BAND EMISSION IN AGGAS2 CRYSTALS.
Journal article,
Phil Won Yu, and Y. S. Park. 3 Oct 73, 7p Rept no. ARL-74-0057
Availability: Pub. in Jnl. of Applied Physics, v45 n2 p823-827 Feb 74.

Descriptors: *Photoluminescence, *Emission spectra, *Semiconductors, Phonons, Spectrum analysis, Spectral lines, Cryogenics, Gallium compounds, Silver compounds, Sulfides, Single crystals, Raman spectra.
Identifiers: *Silver gallium sulfides.

The low-temperature photoluminescence spectra of AgGaS2 are investigated in this work. At 4.2 K, the luminescence spectra are dominated by many sharp lines as well as broad emission bands. A series of emission lines was found to be superimposed on the broad band peaking at about 5000 A. The series of emission lines are attributed to phonon-assisted transitions involving an unidentified impurity or defect. Two basic phonons with energies of 5.4 and 7.2 meV are identified from the phonon structure. The 7.2-meV mode is also seen in the Raman spectrum. They are tentively identified as the lattice modes. (Author)

CEA-R-4490 PC$8.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France).
NUMERICAL SIMULATION OF THE DIFFUSION OF IMPURITIES IN A SEMICONDUCTOR. APPLICATION TO THE CASE OF BORON IN SILICON.
J. Monnier. Jun 74, 99p
In French. U.S. Sales Only.

Descriptors: (*Boron, *Diffusion), Impurities, Semiconductor materials, Silicon, Simulation.

For abstract, see NSA 30 08, number 23405.

COM-74-50871/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
SUPERTRANSFERRED HYPERFINE FIELDS AT SB(5+) IN INSULATING FERRITES: EFFECTS OF LOCAL ORDER AND ION-SPECIFIC PROPERTIES.
Final rept.,
B. J. Evans, and L. J. Swartzendruber. 1974, 5p
Pub. in Proceedings of the American Inst. of Physics Conference on Magnetism and Magnetic Materials (18th) (19th Annual Conference), Boston, Mass., 13-16 Nov 73, p518-522 1974.

Descriptors: *Antimony, *Mossbauer effect, *Ferrites, *Crystal structure, Yttrium iron garnets, Nickel ferrite.
Identifiers: *Ligand fields.

The supertransferred hyperfine fields at Sb(5+) in LiFe5O8, CoFe2O4, and YIG have been determined using 121Sb Mossbauer spectroscopy. The small, average hyperfine field at Sb(5+) in LiFe5O8 requires the existence of significant local order and indicates that the clustering of Li(1+) about Sb(5+) is approximately ten times as large as that expected for a random intrasite cation distribution, in agreement with the known strong influence of Sb substitution in destroying the Li:Fe ordering. The decrement in the hyperfine field at Sb(5+) due to an A-site Co(2+) is also found to be larger than that due to Ni(2+).

COM-74-50894/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
LOCALIZED MOMENTS ON FE IMPURITIES IN NB-MO ALLOYS: MOSSBAUER EFFECT ABSORBER STUDY.
Final rept.,
L. J. Swartzendruber. 1972, 10p
Pub. in International Jnl. of Magnetism, v2 p129-138 1972.

Descriptors: *Molybdenum alloys, *Magnetic moments, Niobium containing alloys, Iron, Impurities, Mossbauer effect.
Identifiers: Magnetic impurities, Iron 57.

Mossbauer effect spectra for absorbers of Mo and Mo(0.8) Nb(0.2) alloys containing 57 Fe impurities have been obtained in an external field as a function of temperature. The spectra for the Mo-Fe alloys are in close agreement with the results of Kitchens at al. for (57Co) Mo sources. The Mo(0.8) Nb(0.2) spectra show the presence of two distinct moment values for the Fe impurities, one with a moment of 1.9 (mu sub B) and one with a moment of zero (with experimental upper limit of 0.6 (mu sub B). The two moment species are present in nearly equal proportions.

IAE-2307 PC$5.75/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii.
PHYSICAL PROPERTIES OF SEMICONDUCTING MATERIALS. PART II. PHYSICAL PROPERTIES OF SEMICONDUCTING COMPOUNDS OF THE TYPE A/SUP X/B/SUP Y/ (X GREATER THAN OR EQUAL TO 3).
B. A. Aronzon, S. D. Lazarev, and E. Z. Meilikhov. 1973, 54p
In Russian. U.S. Sales Only.

Descriptors: (*Semiconductor materials, *Physical properties), Semiconductor devices.

For abstract, see NSA 30 08, number 23445.

ITF-74-12P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
FREE ENERGY OF SIMPLE METALS. II. ALKALI METALS.
P. P. Kostrobii, and Z. A. Gurskii. 1974, 30p
In Russian. U.S. Sales Only.

Descriptors: (*Free energy, *Alkali metals), Debye length, Distribution functions.

For abstract, see NSA 30 08, number 23452.

ITF-74-22P PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
RELAXATION OF EXCITON EXCITATIONS OF CRYSTALS WITH MOLECULAR VIBRATIONS.
A. A. Sepikov. 1974, 31p
In Russian. U.S. Sales Only.

Descriptors: Crystals, Excitation, Excited states, Excitons, Interactions, Kinetics, Molecules, Relaxation.

For abstract, see NSA 30 08, number 23453.

ITF-74-27P PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
QUANTUM FORMALISM IN POINT DEFECT THEORY. I. EFFECTIVE HAMILTONIAN OPERATOR OF THE INTERACTING DEFECT SYSTEM: DEFECT FORMING ENERGY.
S. R. Baran. 1974, 33p
In Russian. U.S. Sales Only.

Descriptors: (*Point defects, *Interactions), (*Anharmonic crystals, Point defects), Atoms, Crystal lattices, Deformation, Energy, Hamiltonians, Particle properties, Perturbation theory, Quantum operators, Solids.

For abstract, see NSA 30 08, number 23454.

ITF-74-28P PC$4.50/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
QUANTUM FORMALISM IN A POINT DEFECT THEORY. II. DEFECT DISTRIBUTION THEORY IN THE DYNAMIC LATTICE.
S. R. Baran. 1974, 30p
In Russian. U.S. Sales Only.

Descriptors: (*Anharmonic crystals, Point defects), (*Point defects, *Distribution), Atoms, Crystal lattices, Interactions, Matrices, Particle properties, Phase transformations, Solids.

For abstract, see NSA 30 08, number 23455.

ITF-74-67P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DYNAMICS OF MAGNETIC CYLINDRICAL DOMAINS.
V. G. Bar'yakhtar, V. V. Gann, and Yu. I. Gorobets. 1974, 16p
In Russian. U.S. Sales Only.

Descriptors: Cylinders, Domain structure, Kinetics, Longitudinal momentum, Magnetic field configurations, Magnetic fields, Magnetic properties, Magnetism, Motion, Pulsations, Shape, Stability, Transverse momentum, Velocity, Wave forms.

For abstract, see NSA 30 08, number 23458.

JINR-E4-7746 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
SOME THEOREMS FOR FREE ENERGY OF MODEL SYSTEMS OF STATISTICAL PHYSICS.
A. M. Kurbatov, and S. S. Lapushkin. 1974, 17p
U.S. Sales Only.

Descriptors: (*Statistical mechanics, *Bogolyubov method), (*Superconductivity, Bogolyubov method), Bcs theory, Ferromagnetism, Hamiltonians.

For abstract, see NSA 30 08, number 22459.

JINR-E4-7981 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
THEORY OF NEUTRON ELASTIC SCATTERING BY NEMATIC LIQUID CRYSTALS.
S. Stamenkovic. 1974, 15p
U.S. Sales Only.

Descriptors: (*Slow neutrons, *Elastic scattering), Crystal structure, Energy, Liquid crystals, Neutrons, Spin.

For abstract, see NSA 30 08, number 23460.

KFK-EXT-3/74-5 PC$4.00/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Experimentelle Kernphysik.
CHANGES OF THE SURFACE IMPEDANCE OF SUPERCONDUCTING NIOBIUM DUE TO OXYGEN INCLUSIONS.
J. Halbritter. Mar 74, 12p
U.S. Sales Only.

Descriptors: (*Niobium, *Superconductivity), Bcs theory, Impedance, Inclusions, Layers, Oxygen.

For abstract, see NSA 30 08, number 22461.

N74-30111/0GA PC$7.50/MF$2.25
Technische Hogeschool, Delft (Netherlands).
INVESTIGATION OF MAGNETIC INTERACTIONS OF NICKEL (II), COLBALT (II), AND MANGANESE (II), IN MAGNETICALLY DILUTE SYSTEMS.
Ph.D. Thesis.
G. C. M. Vanleeuwen. 29 May 74, 89p

Descriptors: *Cobalt, *Magnetic effects, *Magnetic properties, *Manganese, *Nickel, Magnetic materials, Magnetic measurement, Transition metals.

For abstract, see STAR 1219

N74-30137/5GA PC$8.50/MF$2.25
Office National d'Etudes et de Recherches Aerospatiales, Paris (France).
ELECTRON-SOLID INELASTIC INTERACTION FOR LOW ENERGY ELECTRONS.
A. Verdier. 1973, 107p PUB-154
In French; English Summary.

Descriptors: *Electron energy, *Inelastic scattering, *Solid surfaces, *Spectrometers, Atomic energy levels, Electron bombardment, Electron diffraction.

For abstract, see STAR 1219

N74-30194/6GA PC$5.75/MF$2.25
Kentucky Univ., Lexington. Dept. of Metallurgical Engineering and Materials Science.
GRAIN BOUNDARY MOBILITY IN ANION DOPED MGO.
C. M. Kapadia, and M. H. Leipold. 1973, 55p
NASA-CR-139218
Contract NGL-18-001-042

Descriptors: *Anions, *Grain boundaries, *Magnesium, *Oxides, Densification, Kinetics, Porosity, Sintering.

For abstract, see STAR 1219

N74-30195/3GA PC$6.25/MF$2.25
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
CARBON THIN FILM THERMOMETRY.
Final Report.
R. S. Collier, L. L. Sparks, and T. R. Strobridge. Oct 73, 63p NBSIR-74-355, NASA-CR-120333
NASA ORDER H-92167-A

Descriptors: *Carbon, *Temperature measurement, *Thin films, Calibrating, Low temperature, Optimization, Vacuum deposition.

For abstract, see STAR 1219

N74-30196/1GA PC$9.75/MF$2.25
Technische Hogeschool, Delft (Netherlands).
ELASTIC MODULI AND INTERNAL FRICTION OF COLD WORKED COPPER SINGLE CRYSTALS.
Ph.D. Thesis.
D. Weiner. 15 May 74, 133p

Descriptors: *Internal friction, *Modulus of elasticity, Cold working, Copper, Mechanical twinning, Plastic deformation, Single crystals.

For abstract, see STAR 1219

N74-30197/9GA PC$7.00/MF$2.25
Technische Universitaet, Hanover (West Germany).
MAGNETIC RESONANCE STUDIES ON THIN NICKEL, TITANIUM, AND GERMANIUM-EVAPORATED LAYERS MAGNETISCHE RESONANZUNTERSUCHUNGEN AN DUENNEN NICKEL-, TITAN- UND GERMANIUM-AUFDAMPFSCHICHTEN.
Ph.D. Thesis.
S. Bagdonat. 1973, 80p
Language in German.

Descriptors: *Electron paramagnetic resonance, *Metal films, *Vapor deposition, Film thickness, Germanium, Nickel, Semiconducting films, Thin films, Titanium.

For abstract, see STAR 1219

N74-30198/7GA PC$6.75/MF$2.25
Technische Universitaet, Hanover (West Germany).
MEASUREMENT ON THE EFFECT OF NATURAL DEVELOPED SLIPS ON THE HEAT CONDUCTANCE ABILITY OF SINGLE GERMANIUM AND SILICON CRYSTALS AT LOW TEMPERATURES MESSUNG DES EINFLUSSES VON NATUERLICH GEWACHSENEN VERSETZUNGEN AUF DIE WAERMELEITFAEHIGKEIT VON EINKRISTALLINEM BEI TIEFEN TEMPERATUREN.
Ph.D. Thesis.
B. Schwierzi. 1973, 72p
Language in German.

Descriptors: *Conductive heat transfer, *Germanium, *Plastic deformation, *Silicon, Crystal dislocations, Crystal growth, Low temperature, Single crystals, Thermal stresses.

For abstract, see STAR 1219

N74-30203/5GA PC$6.75/MF$2.25
Technische Hogeschool, Eindhoven (Netherlands).
INVESTIGATIONS ON THE PREPARATION, PHOTOCONDUCTIVITY AND PHOTOLUMINESCENCE OF DOPED GALLIUM SULPHIDE SINGLE CRYSTALS.
Ph.D. Thesis.
G. A. Vanderleeden. 26 Jun 73, 75p

Descriptors: *Gallium compounds, *Photoconductivity, *Photoluminescence, *Sulfides, Additives, Hall effect, Luminous intensity, Semiconductors (Materials), Single crystals, Temperature effects.

For abstract, see STAR 1219

N74-30206/8GA PC$3.75/MF$2.25
Monsanto Research Corp., St. Louis, Mo.
INVESTIGATION OF THE GROWTH OF GARNET FILMS BY LIQUID PHASE EPITAXY.
Final Report.
J. W. Moody, R. W. Shaw, and R. M. Sandfort. Jun 74, 64p NASA-CR-2413
Contract NAS1-11794

Descriptors: *Epitaxy, *Ferromagnetic films, *Garnets, *Liquid phases, Anisotropy, Crystal growth, Liquid crystals, Thin films.

For abstract, see STAR 1219

N74-30210/0GA PC$4.50/MF$2.25
Tyco Labs., Inc., Waltham, Mass.
THICK FILM SILICON GROWTH TECHNIQUES.
Quarterly Progress Report, 1 Dec. 1973 28 Feb. 1974.
H. E. Bates, D. N. Jewett, A. I. Mlavsky, and V. E. White. 28 Feb 74, 27p NASA-CR-139301, QPR-8
Contracts NAS7-100, JPL-953365
Subm-Prepared for JPL.

Descriptors: *Dies, *Graphite, *Growth, *Silicon films, Production engineering, Semiconducting films, Solar cells, Thick films.

For abstract, see STAR 1219

N74-31249/7GA PC$7.75/MF$2.25
Technische Hochschule, Hanover (West Germany).
STUDY OF THE INFLUENCE OF CRYSTAL ORIENTATION ON THE FAST SURFACE PROPERTIES OF N-GERMANIUM USING AN IMPROVED ARRANGEMENT FOR FIELD EFFECT MEASUREMENTS UNTERSUCHUNG DES EINFLUSSES DER KRISTALLORIENTIERUNG AUF DIE SCHNELLEN OBERFLAECHENZUSTAENDE VON N-GERMANIUM MIT EINER VERBESSERTEN ANORDNUNG FUER FELDEFFEKTMESSUNGEN.
Ph.D. Thesis.
G. Woltmann. 1973, 95p
Language in German.

Descriptors: *Crystal structure, *Field emission, *Germanium, *N-type semiconductors, Crystal defects, Electrical measurement, Field effect transistors, Lattice vibrations, Surface properties.

For abstract, see STAR 1220

N74-31250/5GA PC$10.00/MF$2.25
Technische Universitaet, Munich (West Germany).
PHOTOELECTRON SPECTROSCOPY ON PURE POLAR GAAS(111) AND (-1-1-1) FACES TO PROVE SURFACE PROPERTIES AND FOR STUDYING OXIDATION BEHAVIOR PHOTOELEKTRONEN-SPEKTROSKOPIE AN REINEN POLAREN GAAS(1-1-1)FLAECHEN ZUM NACHWEIS VON OBERFLAECHENZUSTAENDEN UND ZUM STUDIUM DES OXIDATIONSVERHALTENS.
Ph.D. Thesis.
W. Ranke. 1973, 136p
Language in German.

Descriptors: *Auger spectroscopy, *Gallium arsenides, *Optical properties, *Oxidation, Electrooptics, Molecular excitation, Photoelectric effect, Semiconductors (Materials), Surface properties.

For abstract, see STAR 1220

N74-31251/3GA PC$8.00/MF$2.25
Technische Universitaet, Brunswick (West Germany).
THE OPTICAL CONSTANTS OF GERMANIUM DURING ELECTRON BEAM EXCITATION DIE OPTISCHEN KONSTANTEN VON GERMANIUM UNTER ELEKTRONENSTRAHLANREGUNG.
Ph.D. Thesis.
U. Barkow. 2 Feb 73, 96p
Language in German.

Descriptors: *Electron irradiation, *Germanium, *Optical properties, Carrier injection, Electron bombardment, Excitation, Semiconductors (Materials).

For abstract, see STAR 1220

N74-31253/9GA PC$4.25/MF$2.25
Alabama Univ., University.
INVESTIGATION OF CRYSTAL GROWTH FROM SOLUTIONS.
Progress Report, 22 May - 21 Jul. 1974.
I. Miyagawa. 7 Aug 74, 23p NASA-CR-120380
Contract NAS8-28098

Descriptors: *Crystal growth, *Reduced gravity, *Spacecraft environments, Crystal defects, Crystal lattices, Ferroelectricity, Hysteresis, Salts.

For abstract, see STAR 1220

ZFK-250 PC$4.00/MF$2.25
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
MODERN PROBLEMS IN SUPERCONDUCTIVITY.
L. Muenchow. May 73, 15p
In German. U.S. Sales Only.

Descriptors: Astrophysics, Magnetic fields, Nuclear physics, Solids, Superconductivity, Uses.

For abstract, see NSA 30 08, number 22462.

20M. Thermodynamics

AD-785 610/7GA PC$3.25/MF$2.25
Ballistic Research Labs Aberdeen Proving Ground Md
VAPORIZATION WAVES IN IMPULSIVELY HEATED MATERIALS.
Henry S. Burden. 1972, 16p

Descriptors: *Exploding wires, *Impulse loading, Hydrodynamic codes, Thermodynamics, Heat of vaporization, Impulse noise, Metals.
Identifiers: *Impulse heating.

Computer hydrocodes are essential in determining the magnitude, transmission, and effects of stresses produced when energy is impulsively deposited in a material. As do any solutions of the hydrodynamic equations, these numerical approaches depend upon the form of an auxiliary equation of state for their success. Most hydrocodes give satisfactory treatment in the solid and liquid phases but in codes such as PUFF and RIP the equations of state ignore or improperly treat the liquid-vapor phase change region in which the major expansion of subcritically heated materials takes place. In this paper, a model for this expansion is described which was successful in resolving an anomaly in exploding wire response but is of a type that could not be duplicated by hydrocodes using these equations of state.

AD-785 829/3GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics
TRICRITICAL POINTS IN MULTICOMPONENT FLUID MIXTURES.
Interim rept.,
Alex Hankey, T. S. Chang, and H. E. Stanley. 2 Jul 73, 9p AFOSR-TR-74-1482
Grant AF-AFOSR-2197-72
Availability: Pub. in Physical Review A, v9 n6 p2573-2578 Jun 74.

Descriptors: *Thermodynamics, *Mixtures, *Fluids, Phase studies.
Identifiers: *Critical point.

In view of experimental considerations, the authors give a model-independent argument that the novel tricritical points in multicomponent fluid mixtures, where three phases simultaneously become critical, are points on the boundary of a single two-dimensional surface of critical points. This result is corroborated by the Landau model suggested by Griffiths. The relationship between these tricritical points and the complex 'higher-order' critical points proposed to exist in certain magnetic systems is elucidated. (Author)

AD-785 830/1GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics
NONLINEAR SOLUTIONS OF RENORMALIZATION-GROUP EQUATIONS.
Interim rept.,
J. F. Nicoll, T. S. Chang, and H. E. Stanley. 19 Mar 74, 7p AFOSR-TR-74-1481
Grant AF-AFOSR-2197-72
Availability: Pub. in Physical Review Letters, v32 n25 p1446-1449, 24 Jun 74.

Descriptors: *Thermodynamics, Equations of state.
Identifiers: Critical point.

The authors give the first nonlinear solution of renormalization-group equations. This solution, based on the differential generator of Wegner and Houghton, exhibits an explicit mixing of (or crossover between) critical and mean-field behavior. The solution is given for all values of the spin dimension n and to first order in epsilon identically equal to 4 - d, where d is the lattice dimensionality. (Author)

AD-785 831/9GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Physics
RENORMALIZATION-GROUP CALCULATIONS OF EXPONENTS FOR CRITICAL POINTS OF HIGHER ORDER.
Interim rept.,
T. S. Chang, George F. Tuthill, and H. Eugene Stanley. 12 Nov 73, 9p AFOSR-TR-74-1480
Grant AF-AFOSR-2197-72
Revision of report dated 20 Mar 73.
Availability: Pub. in Physical Review B, v9 n11 p4882-4887, 1 Jun 74.

Descriptors: *Phase transformations, Groups(Mathematics), Mathematical models.
Identifiers: *Renormalization theory, *Critical point.

Critical points of higher order can exist in complex magnetic and fluid systems. By definition, at a critical point of order O,O phases become identical simultaneously. Here the Wilson renormalization-group method is generalized from ordinary critical points (O=2) and Gaussian tricritical points (O=3) to critical points of arbitrary order O. An expansion scheme in (epsilon sub O) identically equal to 2O/(O-1)-d is proposed. The nontrivial fixed points and the critical exponents for O=3,4 are calculated to order (epsilon sub O). The authors present the relevant scaling fields and densities for O=3, and, in an appendix, justify the validity of the approximate recursion relation to order (epsilon sub O). (Author)

AD-785 972/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
THERMODYNAMIC FUNCTIONS OF A POLYTROPIC PROCESS.
M. D. Muravev. 22 Apr 74, 23p Rept no. FSTC-HT-23-1504-73
Trans. of Teploenergetika (USSR) n1 p162-176 1970.

Descriptors: *Thermodynamics, Enthalpy, Entropy, Differential equations, Translations, USSR.
Identifiers: *Polytropic processes.

The formulas for thermodynamic potentials of any polytropic process are derived by a method developed by the author. From these formulas, expressions are then derived formally for the thermodynamic functions of particular processes.

AD-786 101/6GA Reprint
Chicago Univ Ill James Franck Inst
POLARIZATION MODES IN SUPERFLUID HELIUM.
A. Bagchi, and J. Ruvalds. 4 Jun 73, 6p AROD-8595.40-P
Grants DA-ARO-D-31-124-72-G152, NSF-GP-29388
Sponsored in part by Grant NSF-GH-32747.
Availability: Pub. in Physical Review Letters, v32 n5 p209-212, 4 Feb 74.

Descriptors: *Liquid helium, *Superfluidity, Polarization, Raman spectra.

The existence of polarization modes formed by light coupling to pairs of elementary excitations in liquid helium is suggested on theoretical grounds. The mode coupling is calculated by considering the atomic polarization associated with density

fluctuations of two quasiparticles with small total momentum. The mode interactions involve the induced dipole moment of helium atoms and can be enhanced by an external field. The polarization modes may be observable in Raman scattering experiments. (Author)

AD-786 151/1GA Reprint
Cornell Univ Ithaca N Y
FLUCTUATIONS OF THE INTENSITY IN THERMAL RADIATION AND THE THERMODYNAMIC FLUCTUATIONS OF EMITTERS,
Alfonso Rueda. 7 Oct 74, 6p Rept no. PR-A-2099-73
Contract N00014-67-A-0077-0015
Availability: Pub. in Physical Review A, v8 n4 p2099-2102 Oct 73.

Descriptors: *Blackbody radiation, Emittance, Thermodynamics, Thermal radiation, Variations.

The thermodynamic fluctuations of hot bodies emitting thermal radiation generate corresponding fluctuations in the emitted intensity. A simple derivation using standard fluctuation-dissipation arguments shows that such fluctuations manifest themselves in the time correlations of the emitted radiation intensity. An experiment is proposed to detect the intensity correlations. A modified form of the main result satisfying the stationarity condition of the intensity correlations is also obtained.

EUR-5077 PC$4.75/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
DETERMINATION OF THE STEAM CONTENT AND FLOW PATTERN OF A TWO-PHASE MIXTURE IN CONCENTRIC ANNULAR SONDES.
P. Herzberger, and W. Hufschmidt. May 74, 32p
In Dutch. U.S. Sales Only.

Descriptors: (*Two-phase flow, Steam quality), (*Steam quality, *Measuring methods), Impedance, Measuring instruments, Operation, Performance, Temperature dependence, Void fraction.

For abstract, see NSA 30 08, number 20978.

NASA-SP-5959(01) PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
HEAT TRANSFER AND THERMODYNAMICS. A COMPILATION.
29p

Descriptors: Heat transfer, Thermodynamics.

For abstract, see NSA 30 08, number 20979.

N74-30008/8GA PC$4.50/MF$2.25
Tulsa Univ., Okla.
RADIATIVE TRANSFER IN HIGHLY SCATTERING MATERIALS - NUMERICAL SOLUTION AND EVALUATION OF APPROXIMATE ANALYTIC SOLUTIONS.
K. C. Weston, A. C. Reynolds, Jr., A. Alikhan, and D. W. Drago. 1974, 28p NASA-CR-139408
Contract NGR-37-008-003

Descriptors: *Anisotropic media, *Isotropic media, *Materials tests, *Radiative transfer, Mathematical models, Numerical analysis, Thermodynamic properties.

For abstract, see STAR 1219

N74-30110/2GA PC$8.00/MF$2.25
Technische Universitaet, Hanover (West Germany).
LIGHT SCATTERING ON HE-3/HE-4 MIXTURES IN THE HYDRODYNAMIC AND CRITICAL REGIONS LICHTSTREUUNG AN HE-3/HE-4 MISCHUNGEN IM HYDRODYNAMISCHEN UND KRITISCHEN BEREICH.
Ph.D Thesis.
K. D. Kniffki. 1972, 99p
Language in German.

Descriptors: *Helium isotopes, *Light scattering, *Two fluid models, Liquid helium, Liquid-gas mixtures, Phase transformations, Scale effect, Theoretical physics.

For abstract, see STAR 1219

N74-30112/8GA PC$7.25/MF$2.25
Technische Hochschule, Hanover (West Germany).
CRITICAL LIGHT SCATTERING AND SOUND ABSORPTION IN THE LAMBDA TRANSFER OF HE-4 ZUR KRITISCHEN LICHTSTREUUNG UND SCHALLABSORPTION AM LAMBDA UEBERGANG VON HE-4.
Ph.D. Thesis.
H. H. Kretzen. 1972, 83p
Language in German.

Descriptors: *Absorption spectra, *Hydrogen isotopes, *Light scattering, *Phase transformations, Liquid hydrogen, Superfluidity, Theoretical physics, Transport properties, Two fluid models.

For abstract, see STAR 1219

N74-30201/9GA PC$9.25/MF$2.25
Eidgenossische Technische Hochschule, Zurich (Switzerland).
ON THE CONTROLLED FRACTIONAL SOLIDIFICATION FROM THE CONDENSING FILM UEBER DIE GERICHTETE FRAKTIONIERTE KRISTALLISATION AUS DEM RIESELFILM.
Ph.D. Thesis.
M. U. Mayer. 1973, 125p
Language in German.

Descriptors: *Cooling systems, *Fluid flow, *Fractionation, *Mixtures, *Phase transformations, Crystallization, Diphenyl compounds, Dynamic models, Eutectics, Naphthalene, Pipes (Tubes), Surface cooling.

For abstract, see STAR 1219

N74-30365/2GA PC$9.00/MF$2.25
Technische Hogeschool, Delft (Netherlands).
SOME ASPECTS OF THERMOMETRY AND HEAT TRANSFER BELOW 0.3K.
Ph.D. Thesis.
C. Beduz. 1973, 116p

Descriptors: *Carbon, *Heat transfer, *Resistors, *Temperature measurement, Cerium, Magnesium compounds, Nitrates, Relaxation time.

For abstract, see STAR 1219

N74-30367/8GA PC$1.00/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
HEAT TRANSFER AND THERMODYNAMICS: A COMPILATION.
Technology Utilization.
1974, 30p NASA-SP-5959(01)

Descriptors: *Heat transfer, *Technology utilization, *Thermodynamics, Aluminum oxides, Computer programs, Fuel cells, Heat exchangers, Heat sinks, Liquid hydrogen, Oxygen.

For abstract, see STAR 1219

N74-30369/4GA PC$4.00/MF$2.25
Tulsa Univ., Okla. Dept. of Mechanical Engineering.
ENERGY TRANSFER IN VOLUME-REFLECTING HEAT SHIELDS.
Semiannual Status Report, Jan. - Jun. 1974.
K. C. Weston. Jun 74, 19p NASA-CR-139407
Contract NGR-37-008-003

Descriptors: *Analytic functions, *Energy transfer, *Heat shielding, *Problem solving, Heat flux, Reflectance, Scattering functions, Temperature distribution.

For abstract, see STAR 1219

N74-30422/1GA PC$8.00/MF$2.25
Bell Aerospace Co., Buffalo, N.Y.
DATA AND RESULTS FROM A STUDY OF INTERNAL CONVECTIVE COOLING SYSTEMS FOR HYPERSONIC AIRCRAFT.
F. M. Anthony, W. H. Dukes, and R. G. Helenbrook. Jun 74, 365p NASA-CR-132432
Contract NAS1-11357

Descriptors: *Aerodynamic heating, *Cooling systems, *Heat sinks, *Hypersonic aircraft, Aerodynamic configurations, Aircraft design, Airframes, Materials tests, Thermodynamic properties.

For abstract, see STAR 1220

N74-31382/6GA PC$4.00/MF$2.25
Maryland Univ., College Park.
VISCOSITY AND THERMAL CONDUCTIVITY COEFFICIENTS OF GASEOUS AND LIQUID OXYGEN.
Final Report.
H. J. M. Hanley, R. D. Mccarty, and J. V. Sengers. Aug 74, 77p NASA-CR-2440
Contract NGL-21-002-344

Descriptors: *Oxygen, *Thermal conductivity, *Viscosity, Coefficients, Gases, High pressure, Liquids.

For abstract, see STAR 1220

PB-234 582/5GA PC$3.75/MF$2.25
Swedish State Shipbuilding Experimental Tank, Goteborg.
ON THRESHOLD PRESSURES FOR THE ONSET OF BUBBLE GROWTH,
Bror Persson. 1974, 39p
Extended Version of paper presented at the ASME Winter Annual Meeting, held in New York, November, 1972.

Descriptors: *Bubbles, *Growth, *Cavitation, Sweden, Diffusion, Pressure, Temperature, Viscosity, Gas phases, Liquid phases, Mathematical models, Spheres.

Conditions are investigated for the onset of the growth of a spherical gas bubble in a viscous, incompressible liquid. The bubble is assumed to be exposed to a step pressure pulse of infinite duration. The analysis indicates that the effects of inertia, viscosity and thermodynamic state of the gas have little influence on the threshold pressure, while the effect of the gas content is considerable. Thermal relaxation times for a bubble subjected to a step change in the temperature are calculated indicating when the bubble can be considered as isothermal during its expansion. The influence of gas diffusion on the threshold pressure is estimated approximately. The problems considered are to some extent related to the onset of cavitition. (Modified author abstract

SLL-74-0242 PC$15.50/MF$2.25
Sandia Labs., Livermore, Calif.
NUMERICAL STUDY OF NATURAL CONVECTION INSIDE A HORIZONTAL CYLINDER WITH ASYMMETRIC BOUNDARY CONDITIONS.
R. J. Kee. Jul 74, 250p
Contract AT(29-1)-789

Descriptors: (*Natural convection, *Boundary conditions), (*Cylinders, Natural convection),

Compressible flow, Computer codes, Differential equations, Finite difference method, Flow rate, Incompressible flow, Temperature distribution, Vortices.

For abstract, see NSA 30 08, number 20984.

UCLA-ENG-7416 PC$11.00/MF$2.25
California Univ., Los Angeles School of Engineering and Applied Science.
EXPERIMENTAL STUDY OF TRANSLATIONAL RELAXATION IN ARGON AND HELIUM FREE JETS FOR OBTAINING VISCOSITY CROSS SECTION.
P. W. Othmer. Feb 74, 158p

Descriptors: (*Argon, *Viscosity), (*Helium, Viscosity), Boltzmann equation, Boundary conditions, Equilibrium, Field theories, Gases, Relaxation, Spheres, Temperature dependence, Velocity.

For abstract, see NSA 30 08, number 23490.

20N. Wave Propagation

AD-786 065/3GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
MULTI-MODE SURFACE WAVE DIFFRACTION BY A WEDGE,
Samuel N. Karp, and Richard C. Morgan. 6 May 73, 10p Rept no. EL-37
Contract N00014-67-A-0467-0015
Prepared in cooperation with Saint John's Univ., Jamaica, N.Y. Revision of report dated 11 Jan 73.
Availability: Pub. in SIAM Jnl. of Applied Mathematics, v26 n3 p531-538 May 74.

Descriptors: *Surface waves, *Diffraction, Wave functions, Partial differential equations, Boundary value problems.

This paper continues the study of the application of phenomenological boundary conditions to diffraction problems involving surface waves.

AD-915 474/1GA PC$3.25/MF$2.25
Naval Electronics Lab. Center, San Diego, Calif.
RECENT EXPERIMENTS EXPLORING THE PROPERTIES OF F-REGION IRREGULARITIES THAT GIVE RISE TO SPREAD F AND SCINTILLATIONS.
Research and Development rept. Jan-Jul 73,
R. W. Labahn. Oct 73, 21p NELC-TR-1896
Distribution Limitation now Removed.

Descriptors: *Ionospheric propagation, Scintillation, *Ionospheric disturbances, Experimental data, *Atmospheric sounding, Radar signals, Radar equipment, Very high frequency, Radio beacons, Synchronous satellites, Drift, Faraday effect, Incoherent scattering, Probes, Scientific satellites, Plasma stability, F region.

The current state of knowledge of the F-region irregularity phenomenon is determined. In particular, the results of recent experiments are summarized: (1) two in-situ satellite probes that determine the magnitudes, locations, and extents of the irregularity regions; (2) ground-based VHF radar explorations that confirm the turbulent structure of the regions; and (3) long-term monitorings of geostationary satellite beacons which reveal gross drift properties and the dependence on solar activity.

N74-29495/0GA PC$4.00/MF$2.25
Ohio State Univ., Columbus. ElectroScience Lab.
MILLIMETER WAVELENGTH PROPAGATION STUDIES.
Final Report, Dec. 1966 - Jun. 1974.
D. B. Hodge. Jul 74, 18p NASA-CR-139366, FR-2374-18
Contract NGR-36-008-080

Descriptors: *Ats 5 , *Data acquisition, *Space communication, *Statistical analysis, Millimeter waves, Wave propagation.

For abstract, see STAR 1219

N74-30694/5GA PC$5.25/MF$2.25
Ludwig-Maximilians-Universitat, Munich (West Germany).
MEASUREMENTS OF EARTH MAGNETIC FIELD ALONG PROFILES IN THE BEGINNING NORTHERN ALPS AND IN THE ALPINE MOUNTAINS (DELTA Z, DELTA T), 1964 - 1973
VERMESSUNG DES ERDMAGNETISCHEN FELDES LAENGS PROFILEN IM NOERDLICHEN ALPENVORLAND UND IN DEN ALPEN (DELTA Z, DELTA T), 1964 - 1973.
1974, 44p
Language in German.

Descriptors: *Alps mountains (Europe), *Geomagnetism, *Magnetic anomalies, *Magnetic surveys, Earth crust, Geomorphology, Germany, Magnetic measurement, Magnetometers, Nonuniform magnetic fields.

For abstract, see STAR 1220

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-785 962/2GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
SPECTROSCOPIC STUDIES OF COMBUSTION ZONES IN FLAME OF CONDENSED SYSTEMS,
V. M. Maltsev, A. G. Stasenko, B. A. Seleznev, and P. F. Pokhil. 16 Sep 74, 16p Rept no. FTD-HT-23-1236-74
Edited trans. of Fizika Goreniya i Vzryva (USSR) v9 n2 p220-225 Mar/Apr 73, by Marilyn Olaechea.

Descriptors: *Combustion, *Emission spectra, *Flames, Photography, Temperature, Reaction kinetics, Ammonium perchlorate, Nitrocellulose, Polymethyl methacrylate, Molecular spectroscopy, Translations, USSR, Photoelectricity.

The authors pose the problem of identifying the flame radiation spectrum of condensed systems, establishing the distribution of revealed products with respect to the height of the flame, and, if possible, establishing their degree of participation in the combustion process. They studied the flame radiation spectrum of hexogen, a model mixed composition based on ammonium perchlorate and polymethylmethacrylate, and nitrocellulose. The flames which formed during combustion was studied by two spectral methods - photographic and photoelectric.

AD-785 988/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
COMBUSTION OF MIXTURES OF METAL SULFATES WITH MAGNESIUM OR ALUMINUM,
A. V. Vasilev, V. V. Gorbunov, and A. A. Shiviovskii. 19 Nov 73, 7p Rept no. FSTC-HT-1304-73
Trans. of Fizika Goreniya i Vzryva (USSR) p150-152 1971.

Descriptors: *Combustion, *Aluminum, *Magnesium, *Sulfates, Pyrotechnics, Oxidizers, Translations, USSR.

Data are presented on heat of combustion, critical particle size and rates of combustion of Mg Al mixtures with various sulfates and hydrated sulfates. Mixtures with compounds not decomposing at melting temperature burn at rates independent of pressure, with combustion apparently taking place mainly in the condensed phase. The other group, decomposing at or below melting temperature, burn more rapidly as pressure rises, with combustion apparently taking place mainly in the gas phase.

AD-785 996/0GA PC$3.75/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL STUDY OF THE CONDENSED PHASE IN THE COMBUSTION PRODUCTS OF METALLIZED SOLID PROPELLANTS,
P. Kuentzmann. 11 Sep 74, 33p Rept no. FTD-HC-23-2714-74
Edited trans. of la Recherche Aerospatiale (France) n2 p71-80 Mar/Apr 73.

Descriptors: *Combustion products, *Solid propellants, *Particle size, Oxides, USSR, Translations.
Identifiers: *Granulometry.

After recalling the formation processes and the evolution of metallic oxide particles in combustion products of a metallized propellant, the various techniques for experimentally determining their granulometry are presented. It is endeavored to present the characteristics and their limits. The study of experimental results emphasizes the great dispersions which do not permit the definition of the influence of the engine functioning parameters on granulometry other than in a qualitative manner.

AD-786 111/5GA PC$3.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
IGNITION LIMIT OF METAL PARTICLE IN MIXTURE OF TWO OXIDIZERS,
G. K. Ezhovskii, E. S. Ozerov, and A. A. Yurinov. 16 Sep 74, 12p Rept no. FTD-HT-23-1239-74
Edited trans. of Fizika Goreniya i Vzryva (USSR) v9 n2 p325-327 Mar/Apr 73, by Marilyn Olaechea.

Descriptors: *Oxidation, *Metals, *Ignition, Reaction kinetics, Oxides, Oxidizers, Water vapor, Translations, USSR.

AD-786 216/2GA PC$3.25/MF$2.25
Naval Ammunition Depot Crane Ind
THERMODYNAMICS OF COMBUSTION OF VARIOUS PYROTECHNIC COMPOSITIONS.
Final rept. Jan 71-Jul 73,
John E. Tanner, Jr. 11 Jun 74, 24p Rept no. NAD-CR-RDTR-277

Descriptors: *Pyrotechnics, *Combustion, Flames, Heat of combustion, Thermodynamics, Fuels, Oxidizers, Mixtures, Temperature, Aluminum compounds, Sodium compounds.

Heats of reaction and/or adiabatic flame temperature have been computed for a variety of compositions of interest to pyrotechnics. The set of compositions includes pairwise fuel/oxidizer combinations consisting of magnesium, aluminum, beryllium, boron, carbon and silicon with alkali oxides, alkali nitrates, alkali perchlorates, teflon, air and a few other substances. (Modified author abstract)

N74-29638/5GA PC$4.00/MF$2.25
Fluid Mechanics and Thermal Systems, Inc., Waverly, Ala.
COMBUSTION OF HYDROGEN-AIR JETS IN LOCAL CHEMICAL EQUILIBRIUM: A GUIDE TO THE CHARNAL COMPUTER PROGRAM.
Final Report.
D. B. Spalding, B. E. Launder, A. P. Morse, and G. Maples. Jun 74, 87p NASA-CR-2407, REPT-73-1
Contract NAS1-12167

Descriptors: *Air jets, *Hydrogen, *Supersonic combustion, *User manuals (Computer programs), Differential equations, Flow characteristics, Kinetics, Turbulent mixing.

For abstract, see STAR 1219

N74-30234/0GA PC$12.75/MF$2.25
Technische Hochschule, Hanover (West Germany).
THE EFFECT OF IGNITION ACCELERATORS ON IGNITION EFFICIENCY AND KNOCK RESISTANCE OF LIGHT HYDROCARBONS IN COMBUSTION ENGINE DER EINFLUSS VON ZUENDBESCHLEUNIGERN AUF ZUENDWILLIGKEIT UND KLOPFFESTIGKEIT VON LEICHTEN KOHLENWASSERSTOFFEN IM VERBRENNUNGSMOTOR.
Ph.D. Thesis.
K. Becker. 1973, 191p
Language in German.

Descriptors: *Hydrocarbon combustion, *Hydrocarbon fuels, *Internal combustion engines, Accelerating agents, Combustion efficiency, Compressibility, Fuel combustion, Ignition.

For abstract, see STAR 1219

N74-30235/7GA PC$4.00/MF$2.25
National Aerospace Lab., Tokyo (Japan).
COMBUSTION OF COMPOSITE PROPELLANTS IN ACCELERATION FIELD.
S. Ishii, T. Niioka, T. Mitani, M. Takahashi, and M. Izumikawa. 1973, 14p NAL-TR-354
In Japanese; English Summary.

Descriptors: *Acceleration (Physics), *Burning rate, *Interior ballistics, *Propellant combustion, *Solid rocket propellants, Aluminum, Combustion physics, Combustion stability, Propellant properties.

For abstract, see STAR 1219

N74-30364/5GA PC$4.50/MF$2.25
Cranfield Inst. of Technology (England).
CALCULATED ADIABATIC COMBUSTION TEMPERATURES OF HYDROCARBON-AIR MIXTURES.
E. M. Goodger. 1974, 28p CRANFIELD-SME-6

Descriptors: *Adiabatic conditions, *Combustion temperature, *Hydrocarbon combustion, Hydrocarbon fuels, Stoichiometry, Thermal dissociation, Thermodynamics.

For abstract, see STAR 1219

PB-235 674/9GA PC$4.25/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
APPLICATION OF HOLOGRAPHIC METHODS TO THE MEASUREMENT OF FLAMES AND PARTICULATE. VOLUME I.
Final rept.,
A. B. White, and D. E. Haflinger. Apr 74, 69p
TRW-23523-6001-TU-00-Vol-I EPA-650/2-74-031-a
Contract EPA-68-02-0603
See also PB-235 675.

Descriptors: *Flames, *Holography, *Interferometers, Gas flow, Density(Mass/volume), Reaction kinetics, Temperature measurement, Data reduction, Combustion, Burners.
Identifiers: Ruby lasers.

The report gives results of the application of a pulsed ruby laser holographic interferometer to the study of flames, in hopes of extracting temperature profile data. The principle involved is to record holographically the interferogram which presents a three-dimensional record of the interference fringe pattern. The density profile and hence the temperature profile can be calculated from the fringe shift information. The report presents data for a methane-air burner operating both as a diffusion flame and as a premixed flame. The large number of fringe shifts recorded on an interferogram complicated the reduction of the methane-air data, but it was possible to correlate the interferometrically derived temperature data with thermocouple measurements. Application of the technique to a 0.2 gal/hr oil burner was unsuccessful because the highly turbulent flame caused an interference pattern that could not be deciphered. (Modified author abstract)

PB-235 712/7GA PC$7.00/MF$2.25
Battelle Columbus Labs., Ohio.
DESIGN TRENDS AND OPERATING PROBLEMS IN COMBUSTION MODIFICATION OF INDUSTRIAL BOILERS.
Final rept.,
D. W. Locklin, H. H. Krause, A. A. Putnam, E. L.Kropp, and W. T.Reid. Apr 74, 193p EPA-650/2-74-032
Contract EPA-R-802402

Descriptors: *Air pollution, *Combustion control, *Boilers, Coal, Fuel oil, Natural gas, Water tube boilers, Fire tube boilers, Distillates, Residual oils, Stoichiometry, Pulverized fuels, Stationary sources, Firing, Flue gases, Nitrogen oxides, Plant location, Corrosion, Tables(Data).
Identifiers: Air pollution control.

The report gives results of an air pollution emissions control study to: characterize the current field population of industrial boilers; identify trends in boiler design; and assess operating problems associated with combustion modification. Statistics were analyzed to describe the field population and recent sales trends for firetube and watertube industrial boilers in the range from 10 million to 500 million Btu/hr. Boiler capacity, design type, mode of direction, primary and secondary fuels, firing method (for coal), industrial classification, and geographic region of the boiler installation were all considered. When combustion modifications are used to control nitrogen oxide emissions from industrial boilers, practical operating problems may arise, namely: fireside corrosion and deposits on boiler tubes; and flame instability, including blow-off, flashback, combustion-driven oscillations, and combustion noise or roar. These problems were assessed and research needs were identified in relation to such combustion modifications as low-excess-air operation, staged combustion, and fluegas recirculation.

21C. Electric Propulsion

N74-30247/2GA PC$6.25/MF$2.25
Fairchild Republic Div., Farmingdale, N.Y.
DEVELOPMENT OF A SHORT PULSED SOLID PROPELLANT PLASMA THRUSTER.
Final Report.
W. J. Guman. 10 Mar 74, 64p NASA-CR-139272, MS172R0001
Contracts NAS7-100, NAS1-11812
Subm-Prepared for JPL.

Descriptors: *Plasma engines, *Solid rocket propellants, Capacitors, Electric fields, Failure analysis, Feasibility analysis, Heat sinks, Life (Durability), Teflon (Trademark).

For abstract, see STAR 1219

21D. Fuels

PB-235 254/0GA PC$6.25/MF$2.25
Data Resources, Inc., Lexington, Mass.
A STUDY OF THE DEMAND FOR GASOLINE.
Final rept.
Jul 74, 157p*
Contract EQC-322
See also PB-226 132.

Descriptors: *Gasoline, *Demand(Economics), *Taxes, Fuel consumption, Motor vehicles, Prices, Income, Impact, Estimates, Econometrics.
Identifiers: Elasticity of demand.

Calculations of the response of the demand for gasoline to alternative levels of prices and incomes for the next 2 years are given, including specific evaluations of the direct and indirect effects of increases in the gasoline tax are given. The calculations are based on an econometric model of the demand for gasoline developed for Environmental Protection Agency and Council on Environmental Quality by Data Resources, Inc. and projections made using this model in conjunction with the DRI macro econometric model of the U.S. economy.

PB-235 767/1GA PC$3.75/MF$2.25
Bureau of Mines, Anchorage, Alaska. Alaska Field Operation Center.
NATURAL GAS FIELDS, COOK INLET BASIN, ALASKA.
Open file rept.,
Donald P. Blasko. Apr 74, 34p BuMines-OFR-35-74

Descriptors: *Alaska, *Gas reservoirs, Natural resources, Reserves, Gas production, Cook Inlet Basin.

Locations of gas fields within the Cook Inlet area, extent of development of individual fields, estimated recoverable reserves and production, and an analysis of the natural gas from each field are given.

PB-235 983/4GA PC$5.75/MF$2.25
Voorhees (Alan M.) and Associates, Inc., McLean, Va.
GUIDELINES TO REDUCE ENERGY CONSUMPTION THROUGH TRANSPORTATION ACTIONS.
May 74, 128p* UMTA-IT-06-0092-74-2

Descriptors: *Fuel consumption, *Fuel management, *Transportation planning, Transportation management, Urban transportation, Traffic flow, Transit buses, Travel demand, Traffic regulations, Abatement, Conservation.
Identifiers: *Energy conservation.

This document is intended to serve as an aid to local transportation planners, traffic engineers, and administrators in the incorporation of energy conservation considerations into the transportation planning process, especially in reference to short-range transportation planning. Various types of low cost, short-term transportation actions are summarized and their potential, for reducing energy consumption is estimated. Summary tables are presented which array the actions in terms of relevant institutional and legal considerations, and socioeconomic and environmental effects. Interrelationships between the energy consumption reduction potential of groups of actions are discussed and a process for formulation of coherent packages of such actions is presented. Guidelines are presented for evaluating and formulating these action packages for large (1,000,000 and over population), medium (250,000 to 1,000,000), and small (50,000 to 250,000) urban areas.

21E. Jet and Gas Turbine Engines

AD-786 025/7GA PC$6.25/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
DESIGN OF A ROTOR INCORPORATING SPLITTER VANES FOR A HIGH PRESSURE RATIO SUPERSONIC AXIAL COMPRESSOR STAGE.
Interim rept. 1 Nov 71-30 Mar 72,
Arthur J. Wennerstrom, and George R. Frost. Aug 74, 165p Rept no. ARL-74-0110

Descriptors: *Axial flow compressors, *Compressor rotors, Turbomachinery, Gas turbines, Aerodynamics, Pressure, Geometry, Pressure.
Identifiers: *Engineering design, *Design criteria, Computer aided design.

This report describes a redesign of the rotor of a supersonic axial compressor stage. The original design operated with excessive deviation angles as

incidence increased at part speed, and the compressor was never able to recover from this condition. The redesign incorporated splitter vanes consisting of reduced chord airfoils extending full span in the downstream half of each passage defined by the principal airfoils. A complete aerodynamic description of the stage is presented along with the detailed geometry of the new rotor, both on streamsurfaces and on manufacturing (Cartesian) planes. (Author)

N74-29369/7GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
PERFORMANCE OF A 1.15-PRESSURE-RATIO AXIAL-FLOW FAN STAGE WITH A BLADE TIP SOLIDITY OF 0.5.
W. M. Osborn, and R. J. Steinke. Aug 74, 95p NASA-TM-X-3052, E-7433

Descriptors: *Air flow, *Axial flow turbines, *Propeller blades, *Propeller fans, Flow characteristics, Performance tests, Pressure distribution.

For abstract, see STAR 1219

N74-29656/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INVESTIGATION OF THE STALL-INDUCED SHOCK WAVE (HAMMERSHOCK) AT THE INLET TO THE ENGINE.
A. P. Kurkov, R. H. Soeder, and J. E. Moss. 1974, 27p NASA-TM-X-71594, E-8051
Conf-Presented at the Symp. On Propulsion System Structural Integration and Eng. Integrity, Monterey, Calif., 3-6 Sep. 1974.

Descriptors: *Engine failure, *Engine inlets, *Shock waves, *Static pressure, Turbofan engines, Turbojet engines.

For abstract, see STAR 1219

N74-30238/1GA PC$5.00/MF$2.25
Cincinnati Univ., Ohio. Dept. of Aerospace Engineering.
EROSION IN RADIAL INFLOW TURBINES. VOLUME 2: BALANCE OF CENTRIFUGAL AND RADIAL DRAG FORCES ON EROSIVE PARTICLES.
Final Report.
W. B. Clevenger, and W. Tabakoff. Apr 74, 37p NASA-CR-134616
Contract NGR-36-004-055

Descriptors: *Aerodynamic drag, *Particle motion, *Radial flow, *Turbines, Centrifugal force, Erosion, Flow distribution, Particle size distribution.

For abstract, see STAR 1219

N74-30239/9GA PC$16.25/MF$2.25
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
CONCEPTUAL DESIGN STUDIES OF LIFT/CRUISE FANS FOR MILITARY TRANSPORTS.
Final Report.
6 Aug 74, 264p NASA-CR-134636, R74AEG283
Contract NAS3-17850

Descriptors: *Lift fans, *Performance prediction, *Transport aircraft, *V/stol aircraft, Acoustic properties, Aerodynamic noise, Propulsion system configurations, Systems analysis.

For abstract, see STAR 1219

N74-30240/7GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NOISE GENERATED BY QUIET ENGINE FANS. 2: FAN A.
F. J. Montegani, J. W. Schaefer, and E. G. Stakolich. Jul 74, 74p NASA-TM-X-3066, E-7857

Descriptors: *Acoustic properties, *Engine noise, *Power spectra, *Quiet engine program, *Turbofan engines, Acoustic measurements, Data acquisition, Noise intensity, Performance tests.

For abstract, see STAR 1219

N74-30241/5GA PC$4.75/MF$2.25
National Aerospace Lab., Tokyo (Japan).
AERODYNAMIC INVESTIGATION OF AN AIR-COOLED AXIAL-FLOW TURBINE. PART 1: TURBINE DESIGN AND OVERALL STAGE PERFORMANCE WITHOUT SUPPLY OF COOLING-AIR.
A. Yamamoto, K. Takahara, H. Nouse, S. Inoue, and H. Usui. 1973, 34p NAL-TR-321-PT-1
In Japanese; English Summary.

Descriptors: *Engine design, *Gas turbine engines, *Propulsion system configurations, *Rotor blades, Energy conversion efficiency, Environmental tests, Performance tests.

For abstract, see STAR 1219

N74-30242/3GA PC$4.25/MF$2.25
National Aerospace Lab., Tokyo (Japan).
OFF-DESIGN-POINT PERFORMANCES OF MULTI-SPOOL TURBO FAN ENGINES.
M. Morita, and S. Sekine. 1973, 25p NAL-TR-347
In Japanese; English Summary.

Descriptors: *Flight tests, *Performance prediction, *Propulsion system performance, *Turbofan engines, *Turbojet engines, Computer programs, Data acquisition, Data processing, Numerical analysis.

For abstract, see STAR 1219

N74-30243/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
INSTANTANEOUS DISTORTION IN A MACH 2.5, 40-PERCENT-INTERNAL-CONTRACTION INLET AND ITS EFFECT ON TURBOJET STALL MARGIN.
P. L. Burstadt, and J. E. Calogeras. Jul 74, 42p NASA-TM-X-3002, E-6294

Descriptors: *Boundary layer separation, *Inlet flow, *J-58 engine, *Turbocompressors, Angle of attack, Engine tests, Pressure distribution, Pressure effects, Wind tunnel tests.

For abstract, see STAR 1219

N74-30244/9GA PC$5.00/MF$2.25
Boeing Commercial Airplane Co., Seattle, Wash.
ANALYTIC MODELS OF DUCTED TURBOMACHINERY TONE NOISE SOURCES. VOLUME 1: ANALYSIS.
T. L. Clark, U. W. Ganz, G. A. Graf, and J. S. Westall. May 74, 158p NASA-CR-132443, D6-43296-1
Contract NAS1-12257

Descriptors: *Acoustic properties, *Ducted flow, *Sound pressure, *Turbomachinery, Acoustic measurements, Numerical analysis, Subsonic flow, Wave propagation.

For abstract, see STAR 1219

N74-30245/6GA PC$6.75/MF$2.25
Boeing Commercial Airplane Co., Seattle, Wash.
ANALYTIC MODELS OF DUCTED TURBOMACHINERY TONE NOISE SOURCES. VOLUME 2: SUBPROGRAM DOCUMENTATION.
T. L. Clark, U. W. Ganz, G. A. Graf, and J. S. Westall. May 74, 289p NASA-CR-132444, D6-43296-2
Contract NAS1-12257

Descriptors: *Acoustic properties, *Ducted flow, *Sound pressure, *Turbomachinery, Acoustic measurements, Computer programs, Subsonic flow, Wave propagation.

For abstract, see STAR 1219

N74-30246/4GA PC$4.50/MF$2.25
Boeing Commercial Airplane Co., Seattle, Wash.
ANALYTIC MODELS OF DUCTED TURBOMACHINERY TONE NOISE SOURCES. VOLUME 3: PROGRAM TEST CASE RESULTS.
T. L. Clark, U. W. Ganz, G. A. Graf, and J. S. Westall. May 74, 112p NASA-CR-132445, D6-43296-3
Contract NAS1-12257

Descriptors: *Acoustic properties, *Ducted flow, *Sound pressure, *Turbomachinery, Acoustic measurements, Computer programs, Numerical analysis, Subsonic flow, Wave propagation.

For abstract, see STAR 1219

N74-30249/8GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
EFFECTS OF FORWARD VELOCITY AND ACOUSTIC TREATMENT ON INLET FAN NOISE.
C. E. Feiler, and J. E. Merriman. 1974, 21p NASA-TM-X-71591, E-8045
Conf-Presented at the Sixth Aircraft Design Flight Test and Operations Meeting, Los Angeles, 12-14 Aug. 1974; Sponsored by the American Institute of Aeronautics and Astronautics.

Descriptors: *Aircraft engines, *Aircraft noise, *Engine inlets, *Noise reduction, Engine tests, Flight tests, Statistical analysis, Stator blades.

For abstract, see STAR 1219

N74-30250/6GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEST TECHNIQUES FOR OBTAINING OFF-NOMINAL COMPRESSOR DATA DURING ENGINE TESTS.
T. J. Biesiadny. 1974, 18p NASA-TM-X-71597, E-8062
Conf-Proposed for Presentation at the Aerospace Engr. And Manuf. Meeting, San Diego, Calif., 30 Sep. - 3 Oct. 1974; Sponsored by the Society of Automotive Engineers.

Descriptors: *Compressors, *Engine tests, *Jet engines, Analog computers, Engine design, Pressure, Pressure oscillations, Remote control, Temperature gradients, Test facilities.

For abstract, see STAR 1219

N74-30333/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
HIGH-TIP-SPEED FIBER COMPOSITE COMPRESSOR BLADES: VIBRATION AND STRENGTH ANALYSIS.
C. C. Chamis, and J. E. Lynch. 24 May 74, 27p NASA-TM-X-71589, E-8042
Conf-Presented at 2D Conf. On Fibrous Composites in Flight Vehicle Design, Dayton, Ohio, 22-24 May 1974; Sponsored by AFFDL and AFML.

Descriptors: *Compressor blades, *Computer programs, *Dynamic structural analysis, *Vibration tests, Composite materials, Mechanical properties, Tip speed.

For abstract, see STAR 1219

N74-31272/9GA PC$3.00/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TERMINAL-SHOCK AND RESTART CONTROL OF A MACH 2.5, MIXED COMPRESSION INLET COUPLED TO A TURBOFAN ENGINE.
R. J. Baumbick, P. G. Batterton, and C. J. Daniele. Aug 74, 18p NASA-TM-X-3104, E-7924

Descriptors: *Air flow, *Engine inlets, *Flow characteristics, *Inlet flow, *Turbofan engines, Numerical analysis, Supersonic flow, Transfer functions.

For abstract, see STAR 1220

N74-31274/5GA PC$12.00/MF$2.25
General Electric Co., Cincinnati, Ohio.
ADVANCED SUPERSONIC TECHNOLOGY PROPULSION SYSTEM STUDY.
Final Report.
R. Szeliga, and R. D. Allan. Jul 74, 179p NASA-CR-143634, R74AEG330
Contract NAS3-16950

Descriptors: *Supersonic transports, *Turbofan engines, Exhaust nozzles, Hydrogen fuels, Variable thrust.

For abstract, see STAR 1220

PATENT-3 829 237 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
VARIABLY POSITIONED GUIDE VANES FOR AERODYNAMIC CHOKING.
Patent.
D. Chestnutt. Patented 13 Aug 74, 8p PAT-APPL-266 820
Misc-Filed 27 Jun. 1972 Supersedes N72-27820 (10 - 18, p 2479.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Chokes (Restrictions), *Engine inlets, *Engine noise, *Inlet flow, *Jet engines, *Noise reduction, Acoustic properties, Equipment specifications, Flow characteristics, *Patents, Product development.
Identifiers: PAT-CL-415-181.

A choking device to cause a sonic barrier to be formed which reduces the transmission of noise in a direction opposed to the direction of air flow in a compressor that may be part of an aircraft gas turbine engine is described. The noise reduction is accomplished by proper shaping and movement of inlet guide vanes, and an actuator is connected to selected guide vanes to effect movement by programmed amounts as required to choke or partially choke within the design range of the axial-flow-air compressor.

21H. Rocket Motors and Engines

N74-30248/0GA PC$16.50/MF$2.25
Marquardt Corp., Van Nuys, Calif.
DESIGN FOR PRESSURE REGULATING COMPONENTS.
Final Report.
H. Wichmann. Mar 73, 270p NASA-CR-139300, S-1259
Contracts NAS7-100, JPL-953383
Subm-Prepared for JPL.

Descriptors: *Fuel systems, *Pressure regulators, *Propellant storability, *Propellant transfer, Environmental tests, Equipment specifications, Product development, Reliability analysis.

For abstract, see STAR 1219

N74-31206/7GA PC$8.00/MF$2.25
Rocketdyne, Canoga Park, Calif.
ADVANCED ACOUSTIC CAVITY TECHNOLOGY.
Final Report.
W. S. Hines, C. L. Oberg, and L. Kusak. Jun 74, 100p NASA-CR-134388, R-9136
Contract NAS9-12077

Descriptors: *Cavitation flow, *Hydrogen oxygen engines, *Rocket engines, Cavity resonators, Combustion stability, Frequency stability, Temperature profiles.

For abstract, see STAR 1220

N74-31276/0GA PC$4.00/MF$2.25
Rocketdyne, McGregor, Tex.
SPACE SHUTTLE MANEUVERING ENGINE REUSABLE THRUST CHAMBER PROGRAM. TASK 11: LOW EPSILON STABILITY TEST PLAN.
R. P. Pauckert. 1974, 15p NASA-CR-134359, ASR74-204
Contract NAS9-12802

Descriptors: *Combustion chambers, *Rocket engine design, *Space shuttles, *Spacecraft propulsion, Air flow, Cooling systems, Flow characteristics, Flow stability, Performance tests.

For abstract, see STAR 1220

N74-31277/8GA PC$13.25/MF$2.25
Aerojet Liquid Rocket Co., Sacramento, Calif.
EXTENDED TEMPERATURE RANGE ACPS THRUSTER INVESTIGATION.
Final Report.
A. L. Blubaugh, and L. Schoenman. 1 Aug 74, 201p NASA-CR-134655
Contract NAS3-16775

Descriptors: *Attitude control, *Combustion temperature, *Liquid propellant rocket engines, *Propulsion system performance, Ambient temperature, Cryogenic rocket propellants, Ignition temperature, Injectors, Liquid hydrogen, Liquid oxygen, Spark ignition, Thrust control.

For abstract, see STAR 1220

N74-31381/8GA PC$8.75/MF$2.25
Rocketdyne, Canoga Park, Calif.
ANALYSIS OF COMBUSTION INSTABILITY IN LIQUID PROPELLANT ENGINES WITH OR WITHOUT ACOUSTIC CAVITIES.
Final Report.
C. L. Oberg, R. C. Kesselring, C. Warner, Iii, and M. D. Schuman. Jun 74, 114p NASA-CR-134387, R-9353
Contract NAS9-12077

Descriptors: *Combustion stability, *Liquid propellant rocket engines, *Mathematical models, Acoustics, Cavities, Gas turbines.

For abstract, see STAR 1220

21I. Rocket Propellants

N74-29481/0GA PC$10.25/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
COMPATIBILITY TESTING OF SPACECRAFT MATERIALS AND SPACE-STORABLE LIQUID PROPELLANTS.
Final Report Addendum.
L. L. Constantino, J. R. Denson, C. S. Krishnan, and A. Toy. May 74, 144p NASA-CR-139281, TRW-23162-6023-RU-00
Contracts NAS7-100, JPL-953486
Subm-Prepared for JPL.

Descriptors: *Liquid rocket propellants, *Spacecraft construction materials, *Storable propellants, Aluminum alloys, Compatibility, Flox, Fluorine, Propellant storage, Titanium alloys.

For abstract, see STAR 1219

N74-30233/2GA PC$14.25/MF$2.25
Boeing Aerospace Co., Seattle, Wash. Research and Engineering Div.
ADVANCED TECHNIQUES FOR DETERMINING LONG TERM COMPATIBILITY OF MATERIALS WITH PROPELLANTS.
Final Report, 21 Jun. 1972 - 15 Dec. 1973.
R. L. Green, J. P. Stebbins, A. W. Smith, and K. E. Pullen. Dec 73, 223p NASA-CR-139364, D180-14839-2
Contract NAS7-789
Subm-Prepared for JPL.

Descriptors: *Liquid rocket propellants, *Long term effects, *Materials tests, *Propellant storability, Aluminum alloys, Atomic spectra, Flox, Fluorine, Hydrazines, Methylhydrazine, Neutron activation analysis, Titanium alloys.

For abstract, see STAR 1219

N74-30366/0GA PC$4.00/MF$2.25
National Aerospace Lab., Tokyo (Japan).
GAS-PHASE IGNITION OF HYPERGOLIC PROPELLANT SYSTEMS AT REDUCED PRESSURES.
H. Miyajima, A. Suzuki, and H. Sakamoto. 1973, 15p NAL-TR-352
In Japanese; English Summary.

Descriptors: *Hypergolic rocket propellants, *Ignition systems, *Low pressure, *Vapor phases, Ignition temperature, Kinetics.

For abstract, see STAR 1219

N74-31042/6GA PC$4.50/MF$2.25
Northrop Services, Inc., Huntsville, Ala.
A STUDY OF TWO STATISTICAL METHODS AS APPLIED TO SHUTTLE SOLID ROCKET BOOSTER EXPENDITURES.
M. Perlmutter, Y. Huang, and M. Graves. Jul 74, 28p NASA-CR-129032
Contract NAS8-21810

Descriptors: *Monte carlo method, *Probability theory, *Solid propellant rocket engines, *Space shuttle boosters, Cost analysis, Simulation, Spacecraft launching.

For abstract, see STAR 1220

N74-31266/1GA PC$7.75/MF$2.25
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
STUDY OF CRYOGENIC PROPELLANT SYSTEMS FOR LOADING THE SPACE SHUTTLE.
Interim Report.
R. O. Voth, W. G. Steward, and W. J. Hall. Apr 74, 94p NASA-CR-139441, NBSIR-74-366
NASA ORDER CC-03420-A, Contract NBS PROJ. 2750458

Descriptors: *Cryogenic rocket propellants, *Fuel systems, *Propellant transfer, *Space shuttles, Computer programs, Computerized design, Fuel flow, Liquid rocket propellants, Mathematical models.

For abstract, see STAR 1220

N74-31341/2GA PC$7.50/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
COMPATIBILITY TESTING OF SPACECRAFT MATERIALS AND SPACESTORABLE LIQUID PROPELLANTS.
Final Report.
J. R. Denson, and A. Toy. Feb 74, 90p NASA-CR-139391, TRW-23162-6020-RU-00
Contract NAS7-100
Subm-Prepared for JPL.

Descriptors: *Aluminum alloys, *Flox, *Fluorine, *Titanium alloys, Liquid rocket propellants, Space storage, Storable propellants.

For abstract, see STAR 1220

22. SPACE TECHNOLOGY

22A. Astronautics

AD-786 020/8GA PC$7.25/MF$2.25
Aerospace Corp El Segundo Calif Engineering Science Operations
MISSION PLANNING PROGRAM: USAGE GUIDE.
R. H. Prislin, W. F. Rearlick, and D. C. Walker. 15 Jun 74, 201p Rept no. TR-0074(9320)-4 SAMSO-TR-74-188
Contract F04701-73-C-0074

Descriptors: *Mission profiles, *Computer programming, Space exploration, Planning, Orbits, Visibility, Computations, Instruction Manuals.
Identifiers: MPP computer program, *Mission planning.

The Mission Planning Program (MPP) is designed to solve problems related to ground site-to-vehicle visibility. It was written specifically for the CDC 6000/7000 computer series to operate as a stand-alone program in a batch-processing environment. Therefore, no special features or limitations are imposed by the hardware configuration or operating system interfaces. This document is intented to serve as a user's guide for MPP. It describes the program's capabilities, operating modes, and the basic deck structures required (including control cards and input data).

N74-29885/2GA PC$29.50/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROCEEDINGS OF THE THIRD SPACE PROCESSING SYMPOSIUM ON SKYLAB RESULTS, VOLUME 1.
Jun 74, 528p NASA-TM-X-70252, M-74-5-VOL-1
Conf-Symp. Held at Huntsville, Ala., 30 Apr. - 1 May 1974.

Descriptors: *Conferences, *Materials science, *Skylab program, *Weightlessness, Crystal growth, Eutectics, Experimental design, Furnaces, Melting, Solidification.

For abstract, see STAR 1219

N74-29905/8GA PC$30.50/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PROCESSINGS OF THE THIRD SPACE PROCESSING SYMPOSIUM ON SKYLAB RESULTS, VOLUME 2.
Jun 74, 547p NASA-TM-X-70253, M-74-5-VOL-2
Conf-Symp. Held at Huntsville Ala., 30 Apr. - 1 May 1974.

Descriptors: *Conferences, *Materials science, *Skylab program, *Space manufacturing, *Weightlessness, Electrophoresis, Furnaces, Levitation, Reduced gravity, Solidification, Sounding rockets.

For abstract, see STAR 1219

N74-30277/9GA PC$11.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SUPPLEMENT NO. 1 TO THE JANUARY 1974 REPORT ON ACTIVE AND PLANNED SPACECRAFT AND EXPERIMENTS.
R. Horowitz, and L. R. Davis. Jul 74, 159p NASA-TM-X-69913, NSSDC/WDC-A-R/S-74-12

Descriptors: *Electromagnetic measurement, *Experimental design, *Satellite-borne instruments, *Spacecraft, Indexes (Documentation), Mission planning, Research projects, Spacecraft instruments, Tables (Data).

For abstract, see STAR 1219

N74-30280/3GA PC$26.25/MF$2.25
Kanner (Leo) Associates, Annapolis, Md.
THE CONQUEST OF OUTER SPACE IN THE USSR.
G. S. Narimanov. Jul 74, 464p NASA-TT-F-15678
Contract NASW-2481
Tran-Transl. Into English of the Book "Osvoyeniye Kosmicheskogo Prostranstva V Sssr" Moscow, Nauka Press, 1974 224 p.

Descriptors: *Research projects, *U.s.s.r. space program, Economy, International cooperation, Selenology, Space exploration, Space stations.

For abstract, see STAR 1219

N74-30290/2GA PC$17.25/MF$2.25
Martin Marietta Corp., Baltimore, Md.
A FEASIBILITY STUDY OF UNMANNED RENDEZVOUS AND DOCKING IN MARS ORBIT: MIDTERM REVIEW.
Mar 74, 282p NASA-CR-139285
Contract JPL-953746
Subm-Prepared for JPL.

Descriptors: *Feasibility analysis, *Mars probes, *Orbital rendezvous, *Transfer orbits, Mars landing, Mission planning, Spacecraft docking, Unmanned spacecraft.

For abstract, see STAR 1219

N74-30300/9GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MSFC SKYLAB LESSONS LEARNED.
Jul 74, 71p NASA-TM-X-64860

Descriptors: *Project management, *Skylab program, *Technology assessment, Contamination, Ground support equipment, Man machine systems, Mission planning, Systems engineering.

For abstract, see STAR 1219

N74-30303/3GA PC$6.75/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex. Applied Mechanics Section.
APOLLO 16 MISSION REPORT. SUPPLEMENT 2: SERVICE PROPULSION SYSTEM FINAL FLIGHT EVALUATION.
R. J. Smith, and S. C. Wood. Jun 74, 71p
Contract NAS9-12330

Descriptors: *Apollo 16 flight, *Postflight analysis, *Propulsion system performance, Propellant combustion, Thrust vector control, Trajectory analysis.

For abstract, see STAR 1219

N74-30305/8GA PC$9.75/MF$2.25
North American Rockwell Corp., Downey, Calif. Space Div.
SPACE SHUTTLE PHASE B. VOLUME 2: TECHNICAL SUMMARY.
Final Report.
15 Mar 72, 134p NASA-CR-134353, MSC-03332-VOL-2
Contract NAS9-10960

Descriptors: *Research management, *Space shuttles, Aborted missions, Booster rocket engines, Launch vehicle configurations, Test facilities.

For abstract, see STAR 1219

N74-30600/2GA PC$7.75/MF$2.25
Army Engineer Waterways Experiment Station, Vicksburg, Miss. Mobility and Environmental Systems Lab.
PERFORMANCE EVALUATION OF A SECOND-GENERATION ELASTIC LOOP MOBILITY SYSTEM.
Final Report.
K. J. Melzer, and G. D. Swanson. Jun 74, 94p
NASA-CR-139531, M-74-7

Descriptors: *Lunar roving vehicles, *Performance tests, *Research vehicles, Equipment specifications, Systems engineering, Vehicular tracks.

For abstract, see STAR 1220

N74-30843/8GA PC$9.00/MF$2.25
Research Triangle Inst., Research Triangle Park, N.C.
ENGINEERING STUDIES RELATED TO GEODETIC AND OCEANOGRAPHIC REMOTE SENSING USING SHORT PULSE TECHNIQUES.
Final Engineering Report for Tasks B and E.
L. S. Miller, G. S. Brown, and G. S. Hayne. Feb 73, 120p NASA-CR-137466
Contract NAS6-2135

Descriptors: *Altimeters, *Skylab program, Flow charts, Geodesy, Oceanography, Remote sensors, Signal to noise ratios.

For abstract, see STAR 1220

N74-31342/0GA PC$4.50/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
NATURAL ENVIRONMENT SUPPORT GUIDELINES FOR SPACE SHUTTLE TESTS AND OPERATIONS.
E. A. Carter, and S. C. Brown. Jul 74, 108p NASA-TM-X-64864

Descriptors: *Environment effects, *Mission planning, *Space shuttles, Aerial reconnaissance, Environmental monitoring, Flight paths, Operational hazards, Space shuttle boosters, Space shuttle orbiters, Thunderstorms.

For abstract, see STAR 1220

N74-31345/3GA PC$10.75/MF$2.25
Martin Marietta Aerospace, Denver, Colo.
PAYLOAD/ORBITER CONTAMINATION CONTROL REQUIREMENT STUDY.
Final Report.
L. E. Bareiss, R. O. Rantanen, and E. B. Ress. 24 May 74, 154p NASA-CR-120379, MCR-74-93
Contract NAS8-30452

Descriptors: *Computerized simulation, *Payloads, *Space shuttle orbiters, *Spacecraft contamination, Computer programs, Mission planning, Operations research, Space missions.

For abstract, see STAR 1220

22B. Spacecraft

AD-786 121/4GA PC$4.25/MF$2.25
Royal Aircraft Establishment Farnborough (England)
THE DEVELOPMENT OF SPACECRAFT DATA HANDLING SYSTEMS 1963-1973.
Technical rept.,
D. W. Allen. Apr 74, 59p Rept no. RAE-TR-73196 DRIC-BR-40617

Descriptors: *Spacecraft components, *Reliability(Electronics), Spacecraft, Pulse code modulation, Integrated circuits, Redundant components, Data transmission systems, Great Britain.
Identifiers: Ariel 3 satellite, Ariel 4 satellite, Prospero satellite.

The work of the Spacecraft Data Handling Section of Space Department, RAE over the decade 1963-1973 is reviewed. The reasoning behind the progressive development leading up to a modular PCM system is indicated with emphasis on the problems of procuring reliable electronic components.

N74-29727/6GA PC$4.00/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
THE FIRST EARTH RESOURCES TECHNOLOGY SATELLITE NEARLY TWO YEARS OF OPERATION.
W. Nordberg. Jun 74, 14p NASA-TM-X-70715, X-900-74-217
Conf-Presented at the Cospar Seminar on Space Appl. Of Direct Interest to Developing Countries, Sao Paulo, Brazil.

Descriptors: *Earth resources technology satellite 1, *Remote sensors, Earth resources, Forests, Land use, Mapping, Water resources, Wildlife.

For abstract, see STAR 1219

N74-29980/1GA PC$4.25/MF$2.25
Defence Standards Labs., Maribyrnong (Australia).
METALLURGICAL EXAMINATION OF SPACE VEHICLE METAL SPHERES.
L. S. Heard. Mar 74, 25p REPT-581

Descriptors: *Construction materials, *Metallography, *Pressure vessels, *Spacecraft components, Aerodynamic heating, Atmospheric entry, Materials tests, Microstructure.

For abstract, see STAR 1219

N74-30306/6GA PC$4.50/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SKYLAB THRUSTER ATTITUDE CONTROL SYSTEM.
G. E. Wilmer, Jr.. Jul 74, 121p NASA-TM-X-64852

Descriptors: *Attitude control, *Preflight analysis, *Skylab program, *Thrust chambers, Flight tests, Propulsion system performance.

For abstract, see STAR 1219

N74-30307/4GA PC$4.50/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPARATIVE EVALUATION OF EXISTING EXPENDABLE UPPER STAGES FOR SPACE SHUTTLE.
V. J. Weyers, G. D. Sagerman, J. Borsody, and R. J. Lubick. Jun 74, 104p NASA-TM-X-71579, E-8026

Descriptors: *Economic analysis, *Launch vehicles, *Space shuttle boosters, *Space shuttle orbiters, Centaur launch vehicle, Delta launch vehicle, Scout launch vehicle.

For abstract, see STAR 1219

N74-30308/2GA PC$5.50/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
SPACE SHUTTLE SYSTEM PROGRAM DEFINITION. VOLUME 1: EXECUTIVE SUMMARY.
Final Report.
15 Mar 72, 49p NASA-CR-134338, MSC-03824-VOL-1
Contract NAS9-11160

Descriptors: *Propulsion system configurations, *Space shuttles, *Spacecraft configurations, *Spacecraft design, Cost analysis, Management planning, Performance prediction, Systems engineering.

For abstract, see STAR 1219

N74-30309/0GA PC$15.50/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
SPACE SHUTTLE SYSTEM PROGRAM DEFINITION. VOLUME 2: TECHNICAL REPORT.
Final Report.
15 Mar 72, 248p NASA-CR-134339, B35-43-RP-33-VOL-2
Contract NAS9-11160

Descriptors: *Payloads, *Space shuttles, *Spacecraft configurations, *Spacecraft design, Booster rocket engines, Propulsion system configurations, Solid propellant rocket engines.

For abstract, see STAR 1219

N74-30310/8GA PC$5.75/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
SPACE SHUTTLE SYSTEM PROGRAM DEFINITION. VOLUME 4: COST AND SCHEDULE REPORT.
15 Mar 72, 55p MSC-03824-VOL-4
Contract NAS9-11160

Descriptors: *Booster rocket engines, *Space shuttles, *Spacecraft configurations, Cost analysis, Production planning, Rocket engine design, Solid propellant rocket engines.

For abstract, see STAR 1219

N74-30315/7GA PC$9.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MSFC SKYLAB ELECTRICAL POWER SYSTEMS MISSION EVALUATION.
A. P. Woosley. Jun 74, 500p NASA-TM-X-64818

Descriptors: *Electric power supplies, *Orbital workshops, *Skylab program, Data acquisition, Failure analysis, Performance tests, Reliability analysis.

For abstract, see STAR 1219

N74-30334/8GA PC$3.75/MF$2.25
Grumman Aerospace Corp., Bethpage, N.Y.
ANALYSIS OF WING-BODY INTERACTION FLUTTER FOR A PRELIMINARY SPACE SHUTTLE DESIGN.
Final Report.
R. R. Chipman, and P. Shyprykevich. Jul 74, 58p NASA-CR-2429
Contract NAS1-10635

Descriptors: *Aerodynamics, *Space shuttles, *Wing oscillations, Fuselages, Lifting bodies, Spacecraft design, Structural design.

For abstract, see STAR 1219

N74-30536/8GA PC$4.50/MF$2.25
Wisconsin Univ., Madison. Space Science and Engineering Center.
VENUS WIND-ALTITUDE RADAR.
Final Report, 16 Jan. - 30 Jun. 1974.
N. Levanon. Jun 74, 26p NASA-CR-137549
Contract NAS2-8015

Descriptors: *Radiometers, *Venus (Planet), Altimeters, Circuit diagrams, Logic circuits, Pioneer space probes.

For abstract, see STAR 1220

N74-30899/0GA PC$7.75/MF$2.25
Applied Science Associates, Inc., Apex, N.C.
ENGINEERING STUDIES RELATED TO THE GEOS-C RADAR ALTIMETER.
Final Report.
L. S. Miller, and G. S. Brown. May 74, 95p NASA-CR-137462
Contract NAS6-2307

Descriptors: *Geos-c satellite, *Radar measurement, *Radio altimeters, *Water waves, Geoids, Skylab program, Statistical analysis, Systems engineering.

For abstract, see STAR 1220

N74-30900/6GA PC$11.00/MF$2.25
Research Triangle Inst., Research Triangle Park, N.C.
ANALYSIS OF SATELLITE ALTIMETER SIGNAL CHARACTERISTICS AND INVESTIGATION OF SEA-TRUTH DATA REQUIREMENTS.
Final Report.
Apr 72, 159p NASA-CR-137465
Contract NAS6-1952

Descriptors: *Radio altimeters, *Satellite-borne instruments, *Sea states, *Surface roughness, Ground state, Ocean surface, Skylab program.

For abstract, see STAR 1220

N74-31328/9GA PC$5.00/MF$2.25
Lockheed Missiles and Space Co., Sunnyvale, Calif.
REUSABLE AGENA STUDY. VOLUME 1: EXECUTIVE SUMMARY.
Final Report, Jun. 1973 - Jan. 1974.
15 Mar 74, 38p NASA-CR-120361, LMSC-D383059-VOL-1
Contract NAS8-29952
Seri-2.

Descriptors: *Agena rocket vehicles, *Space shuttles, *Space tugs, Reusable rocket engines, Systems engineering, Upper stage rocket engines.

For abstract, see STAR 1220

N74-31329/7GA PC$7.25/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
APOLLO 15 MISSION REPORT. SUPPLEMENT 2: SERVICE PROPULSION SYSTEM FINAL FLIGHT EVALUATION.
R. J. Smith, and S. C. Wood. Nov 72, 81p NASA-TM-X-70291, TRW-20029-H102-RO-00-SUP
Contract NAS9-12330
Subm-Prepared by TRW Systems.

Descriptors: *Apollo 15 flight, *Propulsion system performance, *Spacecraft propulsion, Burning rate, Command service modules, Fuel consumption, Propulsive efficiency.

For abstract, see STAR 1220

N74-31330/5GA PC$4.75/MF$2.25
North American Rockwell Corp., Downey, Calif. Space Div.
SPACE SHUTTLE PHASE B. VOLUME 1: EXECUTIVE SUMMARY.
Final Report.
15 Mar 72, 32p NASA-CR-134352, SD-72-SH-0012-1-VOL-1
Contract NAS9-10960

Descriptors: *Mission planning, *Space missions, *Space shuttles, *Spacecraft configurations, Cost analysis, Management planning, Performance prediction, Spacecraft performance.

For abstract, see STAR 1220

N74-31331/3GA PC$7.75/MF$2.25
North American Rockwell Corp., Downey, Calif. Space Div.
SPACE SHUTTLE PHASE B. VOLUME 2: TECHNICAL SUMMARY, ADDENDUM A.
Final Report.
15 Mar 71, 95p NASA-CR-134354, SD-72-SH-0012-2-VOL-2-AD

Contract NAS9-10960

Descriptors: *Booster rocket engines, *Launch vehicle configurations, *Launch vehicles, *Liquid propellant rocket engines, *Solid propellant rocket engines, *Space shuttle orbiters, Cost analysis, Recoverable launch vehicles, Systems engineering.

For abstract, see STAR 1220

N74-31333/9GA PC$10.50/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
ANALYTICAL DYNAMICS AND NONRIGID SPACECRAFT SIMULATION.
P. W. Likins. 15 Jul 74, 147p NASA-CR-139502, JPL-TR-32-1593
Contract NAS7-100

Descriptors: *Elastic bodies, *Equations of motion, *Mathematical models, *Spacecraft motion, Euler equations of motion, Finite element method, Hamiltonian functions, Lagrange coordinates, Rigid structures, Vectors (Mathematics).

For abstract, see STAR 1220

N74-31334/7GA PC$9.00/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MSFC SKYLAB APOLLO TELESCOPE MOUNT.
A. R. Morse. 28 Jun 74, 429p NASA-TM-X-64811

Descriptors: *Apollo telescope mount, *Project management, *Skylab program, *Technology assessment, Hardware, Performance tests, Prelaunch tests, System effectiveness, Systems engineering.

For abstract, see STAR 1220

N74-31335/4GA PC$9.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
MSFC SKYLAB THERMAL AND ENVIRONMENTAL CONTROL SYSTEM MISSION EVALUATION.
G. D. Hopson, J. W. Littles, and W. C. Patterson. Jun 74, 488p NASA-TM-X-64822

Descriptors: *Environmental engineering, *Skylab program, *Space stations, *Temperature control, Equipment specifications, Performance tests, Systems engineering.

For abstract, see STAR 1220

N74-31337/0GA PC$4.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
THE GEODESIC SATELLITE STARLETTE.
Jul 74, 24p NASA-TT-F-15848
Contract NASW-2481
Tran-Transl. Into English from the French Report.

Descriptors: *Geodesy, *Geodetic satellites, *Lasers, *Satellite design, Geopotential, Ground stations, Position (Location), Tides, Uranium 238.

For abstract, see STAR 1220

N74-31340/4GA PC$5.00/MF$2.25
Research Triangle Inst., Research Triangle Park, N.C.
ENGINEERING STUDIES RELATED TO SKYLAB PROGRAM.
G. S. Hayne. Jul 73, 37p NASA-CR-137463
Contract NAS6-2307

Descriptors: *Automatic gain control, *Skylab program, *Systems engineering, Computer programs, Computerized simulation, Digital computers, Frequency response, Ocean surface, Signal reception, Signal to noise ratios, Surface roughness effects.

For abstract, see STAR 1220

N74-31343/8GA PC$5.50/MF$2.25
General Dynamics/Convair, San Diego, Calif.
ROOM TEMPERATURE STRETCH FORMING OF SCALE SPACE SHUTTLE EXTERNAL TANK DOME GORES. VOLUME 1: TECHNICAL.
Final Report.
R. D. Blunck, and D. E. Krantz. Jun 74, 47p NASA-CR-120365, CASD-NAS-74-029-VOL-1
Contract NAS8-30665
Seri-2.

Descriptors: *Domes (Structural forms), *Gores, *Propellant tanks, *Room temperature, *Scale models, *Space shuttles, *Stretch forming, Aluminum alloys, Cost analysis, Packaging, Production engineering, Tooling.

For abstract, see STAR 1220

N74-31344/6GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PARACHUTE-DEPLOYMENT-PARAMETER IDENTIFICATION BASED ON AN ANALYTICAL SIMULATION OF VIKING BLDT AV-4.
T. A. Talay. Aug 74, 49p NASA-TN-D-7678

Descriptors: *Deceleration, *Parachute descent, *Viking 75 entry vehicle, Mars probes, Mathematical models, Planetary landing.

For abstract, see STAR 1220

N74-31348/7GA PC$4.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
HYPERSONIC STABILITY AND CONTROL CHARACTERISTICS OF THE ROCKWELL INTERNATIONAL 139-B SPACE SHUTTLE ORBITER.
D. R. Stone, and R. Mulfinger. Jul 74, 147p NASA-TM-X-71968

Descriptors: *Hypersonic flight, *Space shuttle orbiters, *Spacecraft stability, *Wind tunnel tests, Flow visualization, Spacecraft control, Spacecraft performance, Static stability.

For abstract, see STAR 1220

N74-31360/2GA PC$4.00/MF$2.25
Boeing Aerospace Co., Seattle, Wash. Research and Engineering Div.
EVALUATION OF A METAL SHEAR WEB SELECTIVELY REINFORCED WITH FILAMENTARY COMPOSITES FOR SPACE SHUTTLE APPLICATION.
Final Report.
J. H. Laakso, and J. W. Straayer. Aug 74, 78p NASA-CR-2409, D180-17969-1
Contract NAS1-10860

Descriptors: *Composite materials, *Space shuttles, *Webs (Supports), Aluminum, Boron, Buckling, Metals, Titanium.

For abstract, see STAR 1220

PAT-APPL-491 417 PC$4.00
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
AUGER ATTACHMENT METHOD FOR INSULATION.
Patent Application.
W. C. Schneider. Filed 24 Jul 74, 11p NASA-CASE-MSC-12615-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Spacecraft, *Thermal insulation, *Patent applications, Spacecraft structures, Specifications, Stresses.

An auger device is used to attach rigid surface insulation to a spacecraft. The auger is screwed into an insulation tile which has been predrilled. The augertile combination is then fastened to the spacecraft using an attachment screw which penetrates the spacecraft skin, which is secured by a blind end fastener. In an alternate method, the auger is incorporated in the insulation tile when the tile is fabricated.

22C. Spacecraft Trajectories and Reentry

N74-30091/4GA PC$4.50/MF$2.25
Auburn Univ., Ala. Aerospace Engineering Dept.
STUDY OF EFFECTS OF UNCERTAINTIES ON COMET AND ASTEROID ENCOUNTER AND CONTACT GUIDANCE REQUIREMENTS. PART 1: GUIDANCE AND NAVIGATION STUDIES.
Final Report.
15 Dec 73, 27p NASA-CR-120329
Contract NAS8-27664

Descriptors: *Rendezvous trajectories, *Space navigation, *Space rendezvous, *Terminal guidance, Asteroids, Comets, Mission planning, Space missions.

For abstract, see STAR 1219

N74-30092/2GA PC$4.75/MF$2.25
Auburn Univ., Ala. Aerospace Engineering Dept.
STUDY OF EFFECTS OF UNCERTAINTIES OF COMET AND ASTEROID ENCOUNTER AND CONTACT GUIDANCE REQUIREMENTS. PART 2: TUMBLING PROBLEM STUDIES.
Final Report.
J. E. Cochran, Jr.. 3 May 74, 33p NASA-CR-120330
Contract NAS8-27664

Descriptors: *Celestial mechanics, *Rendezvous trajectories, *Space navigation, *Space rendezvous, Algorithms, Asteroids, Comets, Mission planning, Space missions, Terminal guidance.

For abstract, see STAR 1219

N74-30284/5GA PC$11.50/MF$2.25
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
A USERS MANUAL FOR A COMPUTER PROGRAM WHICH CALCULATES TIME OPTICAL GEOCENTRIC TRANSFERS USING SOLAR OR NUCLEAR ELECTRIC AND HIGH THRUST PROPULSION.
L. L. Sackett, T. N. Edelbaum, and H. L. Malchow. Jun 74, 169p NASA-CR-139038, R-827
Contracts NAS5-21791, MIT PROJ. 55-51300

Descriptors: *Computer programs, *Manuals, *Solar propulsion, Fortran, Ibm 360 computer, Input/output routines, Time optimal control, Trajectory control.

For abstract, see STAR 1219

N74-30285/2GA PC$4.00/MF$2.25
Techtran Corp., Glen Burnie, Md.
TRAJECTORIES OF SOLAR SATELLITE FOR RADIO SOUNDING OF CIRCUMSOLAR SPACE.
G. A. Mersov. Jul 74, 12p NASA-TT-F-15771, PR-163
Contract NASW-2485
Tran-Transl. Into English of "Trayektorii Sputnika Solntsa Dlya Radiosondirovaniya Okolosolnechnogo Prostranstva" Moscow, Acad. Of Sci. Ussr, PR-163, 1974 15 p.

Descriptors: *Radiosondes, *Satellites, *Trajectories, Earth (Planet), Perturbation theory, Solar orbits, Sun, Velocity.

For abstract, see STAR 1219

N74-30314/0GA PC$10.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
A GENERALIZED TECHNIQUE FOR USING CONES AND DIHEDRAL ANGLES IN ATTITUDE DETERMINATION, REVISION 1.
R. D. Werking. Sep 73, 151p NASA-TM-X-70705, X-581-73-292-REV-1

Descriptors: *Dihedral angle, *Satellite attitude control, *Satellite rotation, *Spacecraft stability, Computer programs, Conical bodies, Numerical analysis, Performance prediction, Sensors.

For abstract, see STAR 1219

N74-31299/2GA PC$20.50/MF$2.25
Auburn Univ., Ala. School of Engineering.
MULTIVARIANT FUNCTION MODEL GENERATION.
Final Report.
Jan 74, 346p NASA-CR-139443
Contract NGR-01-003-008

Descriptors: *Computer programs, *Computer techniques, *Orbital mechanics, *Space navigation, *Spacecraft guidance, *Trajectory analysis, Applications of mathematics, Atmospheric entry, Hamilton-jacobi equation, Spacecraft performance.

For abstract, see STAR 1220

N74-31310/7GA PC$6.50/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, FLIGHT 1, VISUAL OBSERVATIONS, EQUATORIAL COORDINATES, JULY - OCTOBER 1971.
I. I. Katrovskaya. 1973, 69p ISSUE-14(154)
Language in Russian.

Descriptors: *Artificial satellites, *Astronomical coordinates, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31311/5GA PC$6.50/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, EXPLORER 32, FLIGHT 1, VISUAL OBSERVATIONS, EQUATORIAL COORDINATES, FEBRUARY - NOVEMBER 1972, APRIL - DECEMBER 1972.
I. I. Katrovskaya. 1973, 70p ISSUE-15(155)
Language in Russian.

Descriptors: *Astronomical coordinates, *Explorer 32 satellite, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31312/3GA PC$6.00/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, EXPLORER 19, VISUAL OBSERVATIONS, EQUATORIAL COORDINATES, APRIL - DECEMBER 1972.
I. I. Katrovskaya. 1973, 60p ISSUE-19(159)
Language in Russian.

Descriptors: *Astronomical coordinates, *Explorer 19 satellite, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31313/1GA PC$6.00/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, FLIGHT 1, EXPLORER 19, VISUAL OBSERVATIONS, HORIZONTAL COORDINATES, MARCH - NOVEMBER, 1972, MARCH - OCTOBER 1972.
I. I. Katrovskaya. 1973, 56p ISSUE-16(156)
Language in Russian.

Descriptors: *Astronomical coordinates, *Explorer 19 satellite, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31314/9GA PC$5.75/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, EXPLORER 19, EXPLORER 32, AUREOLE, VISUAL OBSERVATIONS, HORIZONATL COORDINATES, MARCH - NOVEMBER 1972.
I. I. Katrovskaya. 1973, 55p ISSUE-17(157)
Language in Russian.

Descriptors: *Astronomical coordinates, *Explorer 19 satellite, *Explorer 32 satellite, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31315/6GA PC$6.25/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, EXPLORER 19, EXPLORER 39, AUREOLE, VISUAL OBSERVATIONS, EQUATORIAL COORDINATES, FEBRUARY - MARCH 1972, FEBRUARY - SEPTEMBER 1972, MARCH - DECEMBER 1972.
I. I. Katrovskaya. 1973, 62p ISSUE-18(158)
Language in Russian.

Descriptors: *Astronomical coordinates, *Explorer 19 satellite, *Explorer 32 satellite, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31316/4GA PC$6.00/MF$2.25
Ryazan State Pedagogical Inst. (USSR).
RESULTS OF ARTIFICIAL EARTH SATELLITE OBSERVATIONS, EXPLORER 19, VISUAL OBSERVATIONS, HORIZONTAL COORDINATES, JANUARY - JUNE 1973.
I. I. Katrovskaya. 1973, 60p ISSUE-20(160)
Language in Russian.

Descriptors: *Astronomical coordinates, *Explorer 19 satellite, *Satellite orbits, *Satellite tracking, Ground stations, Optical tracking, Tables (Data), U.s.s.r., Visual perception.

For abstract, see STAR 1220

N74-31320/6GA PC$6.25/MF$2.25
International Business Machines Corp., Gaithersburg, Md.
TARGETTING AND GUIDANCE PROGRAM DOCUMENTATION.
Final Report.
E. F. Harrold, and J. F. Neyhard. 15 Jul 74, 61p NASA-CR-120393
Contract NAS8-28425
Subm-Prepared in Cooperation with IBM, Burlington, Mass.

Descriptors: *Command guidance, *Computer programs, *Target simulators, *User manuals (Computer programs), Algorithms, Fortran, Input/output routines, Subroutine libraries (Computers).

For abstract, see STAR 1220

N74-31349/5GA PC$4.50/MF$2.25
Royal Observatory, Edinburgh (Scotland). Satellite Tracking Section.
KINETHEODOLITE OBSERVATIONS MADE AT EARLYBURN DURING THE OBSERVING YEAR 1964 - 1965, PART 6.
K. S. Russell. 6 Apr 74, 30p ROE-STS-174-PT-6

Descriptors: *Cinetheodolites, *Satellite tracking, *Tables (Data), Artificial satellites, Azimuth, Elevation angle, Great britain, Photographic tracking.

For abstract, see STAR 1220

SAND-74-56 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
BASE PRESSURE AND HEAT-TRANSFER MEASUREMENTS ON A SLENDER REENTRY VEHICLE AT M/SUB INFINITY/ = 18.
B. M. Bulmer. Jul 74, 19p
Contract AT(29-1)-789

Descriptors: (*Space vehicles, *Reentry), Configuration, Heat transfer, Laminar flow, Pressure measurement, Testing, Turbulent flow.

For abstract, see NSA 30 08, number 23476.

SLA-74-0169 PC$4.75/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
CORRELATION OF REENTRY BASE PRESSURE IN LAMINAR HYPERSONIC FLOW.
B. M. Bulmer. Aug 74, 34p
Contract AT(29-1)-789

Descriptors: (*Space vehicles, *Reentry), Boundary conditions, Compression, Configuration, Correlations, Electrons, Laminar flow, Motion, Performance testing, Reynolds number.

For abstract, see NSA 30 08, number 23480.

22D. Spacecraft Launch Vehicles and Ground Support

N74-31346/1GA PC$5.00/MF$2.25
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
REUSABLE CENTAUR STUDY. VOLUME 1: EXECUTIVE SUMMARY.
Final Report, Jun. - Dec. 1973.
D. A. Heald. 15 Mar 74, 38p NASA-CR-120372, CASD-NAS-73-032-VOL-1
Contract NAS8-30290
Seri-2.

Descriptors: *Centaur launch vehicle, *Propulsion system configurations, *Reusable launch vehicles, *Space shuttle orbiters, *Space tugs, Cost analysis, Propulsion system performance, Space transportation, Systems engineering.

For abstract, see STAR 1220

N74-31347/9GA PC$19.00/MF$2.25
General Dynamics/Convair, San Diego, Calif. Aerospace Div.
REUSABLE CENTAUR STUDY. VOLUME 2: FINAL REPORT.
Report for Jun. - Dec. 1973.
D. A. Heald. 15 Mar 74, 317p 0NASA-CR-120373, 0CASD-NAS-73-032-VOL-2
Contract 0NAS8-302900
Seri-2.

Descriptors: *Centaur launch vehicle, *Propulsion system configurations, *Reusable launch vehicles, *Space shuttles, *Space tugs, Cost analysis, Propulsion system performance, Space transportation, Systems engineering.

For abstract, see STAR 1220

REPORT LOCATOR LIST

This list comprises all the reports cited in this issue. It is arranged alpha-numerically by accession number. The subject field and group where the report citation can be located in the journal precedes the accession number.

All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 74, Number 24.**

09B AAEC/E-312
11F AD-785 591/9GA
13C AD-785 592/7GA
13C AD-785 593/5GA
13C AD-785 594/3GA
13C AD-785 595/0GA
20E AD-785 596/8GA
13H AD-785 597/6GA
13L AD-785 598/4GA
12A AD-785 599/2GA
05B AD-785 600/8GA
06Q AD-785 601/6GA
20E AD-785 602/4GA
15C AD-785 603/2GA
09E AD-785 604/0GA
20D AD-785 605/7GA
01C AD-785 606/5GA
19D AD-785 607/3GA
20L AD-785 608/1GA
06R AD-785 609/9GA
20M AD-785 610/7GA
20E AD-785 611/5GA
19F AD-785 612/3GA
15E AD-785 613/1GA
14D AD-785 614/9GA
20F AD-785 615/6GA
08H AD-785 616/4GA
11F AD-785 617/2GA
20I AD-785 618/0GA
19A AD-785 619/8GA
06E AD-785 620/6GA
19D AD-785 621/4GA
19A AD-785 622/2GA
12A AD-785 623/0GA
07C AD-785 624/8GA
17G AD-785 625/5GA
06S AD-785 626/3GA
19C AD-785 627/1GA
01C AD-785 628/9GA
07D AD-785 629/7GA
06L AD-785 630/5GA
08L AD-785 631/3GA
13K AD-785 632/1GA
05B AD-785 633/9GA
11I AD-785 634/7GA
05I AD-785 635/4GA
09E AD-785 636/2GA
09E AD-785 637/0GA
07D AD-785 638/8GA
05J AD-785 639/6GA
17G AD-785 640/4GA
07D AD-785 641/2GA
15E AD-785 642/0GA
15C AD-785 643/8GA
17H AD-785 644/6GA
07D AD-785 645/3GA
01C AD-785 646/1GA
06M AD-785 647/9GA
06S AD-785 648/7GA
19A AD-785 649/5GA
15C AD-785 650/3GA
06M AD-785 651/1GA
20L AD-785 652/9GA
20K AD-785 653/7GA
19A AD-785 654/5GA
06A AD-785 655/2GA
06H AD-785 656/0GA
01C AD-785 657/8GA
13F AD-785 658/6GA
19D AD-785 659/4GA
06F AD-785 660/2GA
09A AD-785 661/0GA
20F AD-785 662/8GA
20L AD-785 663/6GA
04B AD-785 664/4GA
19D AD-785 665/1GA
20F AD-785 666/9GA
20E AD-785 667/7GA
05I AD-785 668/5GA
20E AD-785 669/3GA
06M AD-785 670/1GA
11D AD-785 671/9GA
05B AD-785 672/7GA
06E AD-785 673/5GA
06L AD-785 674/3GA
14B AD-785 675/0GA
15C AD-785 676/8GA
17G AD-785 677/6GA
07E AD-785 678/4GA
06T AD-785 679/2GA
19A AD-785 680/0GA
19D AD-785 681/8GA
09A AD-785 682/6GA
04A AD-785 683/4GA
06F AD-785 684/2GA
06F AD-785 685/9GA
15E AD-785 686/7GA
20E AD-785 687/5GA
19A AD-785 688/3GA
09E AD-785 689/1GA
11F AD-785 690/9GA
19A AD-785 691/7GA
19A AD-785 692/5GA
14B AD-785 693/3GA
20F AD-785 694/1GA
11F AD-785 695/8GA
19D AD-785 696/6GA
17H AD-785 697/4GA
08B AD-785 698/2GA
06S AD-785 699/0GA
19A AD-785 700/6GA
19F AD-785 701/4GA
06M AD-785 702/2GA
06R AD-785 703/0GA
19F AD-785 704/8GA
09E AD-785 705/5GA
05I AD-785 706/3GA
11C AD-785 707/1GA
06A AD-785 708/9GA
20L AD-785 709/7GA
17H AD-785 710/5GA
09E AD-785 711/3GA
20L AD-785 712/1GA
04A AD-785 713/9GA
09E AD-785 714/7GA
09E AD-785 715/4GA
08C AD-785 716/2GA
11B AD-785 717/0GA
04B AD-785 718/8GA
11H AD-785 719/6GA
06E AD-785 720/4GA
06A AD-785 721/2GA
12B AD-785 722/0GA
09A AD-785 723/8GA
06M AD-785 724/6GA
11F AD-785 725/3GA
05B AD-785 726/1GA
08B AD-785 727/9GA
20D AD-785 728/7GA
17I AD-785 729/5GA
20E AD-785 730/3GA
08G AD-785 731/1GA
10C AD-785 732/9GA
17G AD-785 733/7GA
20K AD-785 734/5GA
06L AD-785 735/2GA
14B AD-785 736/0GA
09A AD-785 737/8GA
17B AD-785 738/6GA
06R AD-785 739/4GA
06J AD-785 740/2GA
04B AD-785 741/0GA
06B AD-785 742/8GA
09A AD-785 743/6GA
20L AD-785 744/4GA
09A AD-785 745/1GA
06E AD-785 746/9GA
13B AD-785 747/7GA
13C AD-785 748/5GA
06K AD-785 749/3GA
06C AD-785 750/1GA
08A AD-785 751/9GA
08A AD-785 752/7GA
06C AD-785 753/5GA
06M AD-785 754/3GA
13G AD-785 755/0GA
11F AD-785 756/8GA
20L AD-785 757/6GA
20L AD-785 758/4GA
05G AD-785 759/2GA
20J AD-785 760/0GA
06M AD-785 761/8GA
06C AD-785 762/6GA
06C AD-785 763/4GA
06C AD-785 764/2GA
06A AD-785 765/9GA
06C AD-785 766/7GA
11F AD-785 767/5GA
14B AD-785 768/3GA
20L AD-785 769/1GA
20D AD-785 770/9GA
14C AD-785 771/7GA
08H AD-785 772/5GA
06O AD-785 773/3GA
06A AD-785 774/1GA
06C AD-785 775/8GA
06C AD-785 776/6GA
07D AD-785 777/4GA
11D AD-785 778/2GA
20D AD-785 779/0GA
17B AD-785 780/8GA
06M AD-785 781/6GA
11F AD-785 782/4GA
07D AD-785 783/2GA
07D AD-785 784/0GA
12A AD-785 785/7GA
20D AD-785 786/5GA
06C AD-785 787/3GA
07D AD-785 788/1GA
07D AD-785 789/9GA
06A AD-785 790/7GA
07D AD-785 791/5GA
07D AD-785 792/3GA
08B AD-785 793/1GA
12A AD-785 794/9GA
07D AD-785 795/6GA
20B AD-785 796/4GA
04A AD-785 797/2GA
12A AD-785 798/0GA
20F AD-785 799/8GA
06C AD-785 800/4GA
02E AD-785 801/2GA
13H AD-785 802/0GA
20D AD-785 803/8GA
06E AD-785 804/6GA
07D AD-785 805/3GA
06E AD-785 806/1GA
06C AD-785 807/9GA
20D AD-785 808/7GA
12A AD-785 809/5GA
20D AD-785 810/3GA
07D AD-785 811/1GA
11F AD-785 812/9GA
08L AD-785 813/7GA
20L AD-785 814/5GA
12A AD-785 815/2GA
06S AD-785 816/0GA
12A AD-785 817/8GA
12A AD-785 818/6GA
07E AD-785 819/4GA
11F AD-785 820/2GA
06P AD-785 821/0GA
07C AD-785 822/8GA
12A AD-785 823/6GA
04A AD-785 824/4GA
04A AD-785 825/1GA
12A AD-785 826/9GA
12A AD-785 827/7GA
12A AD-785 828/5GA
20M AD-785 829/3GA
20M AD-785 830/1GA
20M AD-785 831/9GA
06P AD-785 832/7GA
14B AD-785 833/5GA
13J AD-785 834/3GA
13J AD-785 835/0GA
13J AD-785 836/8GA
13J AD-785 837/6GA
08B AD-785 838/4GA
19A AD-785 839/2GA
11F AD-785 840/0GA
04A AD-785 841/8GA
20I AD-785 842/6GA
08E AD-785 843/4GA
13I AD-785 844/2GA
05I AD-785 845/9GA
05I AD-785 846/7GA
19D AD-785 847/5GA
12A AD-785 849/1GA
09D AD-785 850/9GA
06S AD-785 851/7GA
17A AD-785 852/5GA
20D AD-785 853/3GA
13I AD-785 854/1GA
04B AD-785 855/8GA
09A AD-785 856/6GA
01E AD-785 857/4GA
09C AD-785 858/2GA
17G AD-785 859/0GA
06M AD-785 860/8GA
06C AD-785 861/6GA
09E AD-785 862/4GA
06A AD-785 863/2GA
12A AD-785 864/0GA
12A AD-785 865/7GA
12B AD-785 866/5GA
08J AD-785 867/3GA
05J AD-785 868/1GA
08E AD-785 869/9GA
20L AD-785 870/7GA
06F AD-785 871/5GA
14B AD-785 872/3GA
06C AD-785 873/1GA
13J AD-785 874/9GA
17A AD-785 875/6GA
09B AD-785 876/4GA
08B AD-785 877/2GA
12A AD-785 878/0GA
08G AD-785 879/8GA
13I AD-785 880/6GA
20L AD-785 881/4GA
08E AD-785 882/2GA
13F AD-785 883/0GA
07B AD-785 884/8GA
14C AD-785 885/5GA
08E AD-785 886/3GA
13F AD-785 887/1GA
09E AD-785 888/9GA
19D AD-785 889/7GA
11F AD-785 890/5GA
04B AD-785 891/3GA
05I AD-785 892/1GA
05D AD-785 893/9GA
15E AD-785 894/7GA
15E AD-785 895/4GA
05I AD-785 896/2GA
12A AD-785 897/0GA
11F AD-785 898/8GA
07D AD-785 899/6GA
05I AD-785 900/2GA
01C AD-785 901/0GA
17A AD-785 902/8GA
09E AD-785 903/6GA
14E AD-785 904/4GA
08J AD-785 905/1GA
05E AD-785 906/9GA
11F AD-785 907/7GA
12B AD-785 908/5GA
06B AD-785 909/3GA
13H AD-785 910/1GA
20E AD-785 911/9GA
12B AD-785 912/7GA
07D AD-785 913/5GA
20K AD-785 914/3GA
11F AD-785 915/0GA
15C AD-785 916/8GA
13D AD-785 917/6GA
07D AD-785 918/4GA
07D AD-785 919/2GA
09E AD-785 920/0GA
01A AD-785 921/8GA
05J AD-785 922/6GA
07D AD-785 923/4GA
12A AD-785 924/2GA
20K AD-785 925/9GA
05I AD-785 926/7GA
20D AD-785 927/5GA
13J AD-785 928/3GA
01C AD-785 929/1GA
11B AD-785 930/9GA
14E AD-785 931/7GA

08B AD-785 932/5GA
07D AD-785 933/3GA
07E AD-785 934/1GA
13F AD-785 935/8GA
08B AD-785 936/6GA
09A AD-785 937/4GA
15E AD-785 938/2GA
09E AD-785 939/0GA
09E AD-785 940/8GA
20L AD-785 941/6GA
11B AD-785 942/4GA
09B AD-785 943/2GA
12A AD-785 944/0GA
07D AD-785 945/7GA
20K AD-785 946/5GA
20F AD-785 947/3GA
10B AD-785 948/1GA
13G AD-785 949/9GA
05C AD-785 950/7GA
15E AD-785 951/5GA
13L AD-785 952/3GA
15E AD-785 953/1GA
05I AD-785 954/9GA
13B AD-785 955/6GA
15F AD-785 956/4GA
05A AD-785 957/2GA
12A AD-785 958/0GA
09E AD-785 959/8GA
06L AD-785 960/6GA
06H AD-785 961/4GA
21B AD-785 962/2GA
11A AD-785 963/0GA
13F AD-785 964/8GA
09E AD-785 965/5GA
06C AD-785 966/3GA
08M AD-785 967/1GA
20K AD-785 968/9GA
04A AD-785 969/7GA
10C AD-785 970/5GA
07D AD-785 971/3GA
20M AD-785 972/1GA
05B AD-785 973/9GA
07E AD-785 974/7GA
20K AD-785 975/4GA
13F AD-785 976/2GA
13G AD-785 977/0GA
06H AD-785 978/8GA
11F AD-785 979/6GA
19A AD-785 980/4GA
20K AD-785 981/2GA
13H AD-785 982/0GA
11H AD-785 983/8GA
09E AD-785 984/6GA
09E AD-785 985/3GA
11A AD-785 986/1GA
14E AD-785 987/9GA
21B AD-785 988/7GA
19A AD-785 989/5GA
14B AD-785 990/3GA
14E AD-785 991/1GA
20L AD-785 992/9GA
20K AD-785 993/7GA
07D AD-785 994/5GA
21B AD-785 996/0GA
07A AD-785 997/8GA
08E AD-785 998/6GA
03B AD-785 999/4GA
04A AD-786 000/0GA
06E AD-786 001/8GA
06S AD-786 002/6GA
07D AD-786 003/4GA
05I AD-786 004/2GA
09C AD-786 005/9GA
12A AD-786 006/7GA
06E AD-786 007/5GA
14B AD-786 008/3GA
20A AD-786 009/1GA
13J AD-786 010/9GA
20A AD-786 011/7GA
08J AD-786 012/5GA
20A AD-786 013/3GA
04B AD-786 014/1GA
13C AD-786 015/8GA
02E AD-786 016/6GA
17J AD-786 017/4GA
22A AD-786 020/8GA
07D AD-786 021/6GA
09E AD-786 022/4GA
15G AD-786 023/2GA
09E AD-786 024/0GA
21E AD-786 025/7GA
07D AD-786 026/5GA
13E AD-786 027/3GA
13B AD-786 028/1GA
11E AD-786 029/9GA
20E AD-786 030/7GA
20L AD-786 031/5GA
17H AD-786 032/3GA
17I AD-786 033/1GA
17B AD-786 034/9GA
07C AD-786 035/6GA
03B AD-786 036/4GA
17B AD-786 037/2GA
09A AD-786 038/0GA
17H AD-786 039/8GA
05I AD-786 040/6GA
05I AD-786 041/4GA
05I AD-786 042/2GA
20K AD-786 043/0GA
06C AD-786 044/8GA
09E AD-786 045/5GA
10B AD-786 046/3GA
14B AD-786 047/1GA
05J AD-786 048/9GA
05J AD-786 049/7GA
05J AD-786 050/5GA
05J AD-786 051/3GA
06A AD-786 052/1GA
06M AD-786 053/9GA
06C AD-786 054/7GA
14B AD-786 055/4GA
19D AD-786 056/2GA
14B AD-786 057/0GA
17J AD-786 058/8GA
07D AD-786 059/6GA
19D AD-786 060/4GA
09B AD-786 061/2GA
09A AD-786 062/0GA
13J AD-786 063/8GA
12B AD-786 064/6GA
20N AD-786 065/3GA
09D AD-786 066/1GA
06A AD-786 067/9GA
07D AD-786 068/7GA
07D AD-786 069/5GA
11F AD-786 070/3GA
07D AD-786 071/1GA
11I AD-786 072/9GA
07D AD-786 073/7GA
07D AD-786 075/2GA
20K AD-786 076/0GA
20E AD-786 077/8GA
20L AD-786 078/6GA
11B AD-786 079/4GA
20F AD-786 080/2GA
12A AD-786 081/0GA
11I AD-786 082/8GA
07D AD-786 083/6GA
09B AD-786 084/4GA
11F AD-786 085/1GA
09B AD-786 086/9GA
13H AD-786 087/7GA
12A AD-786 088/5GA
20L AD-786 089/3GA
07D AD-786 090/1GA
11F AD-786 091/9GA
07E AD-786 092/7GA
13A AD-786 093/5GA
12A AD-786 094/3GA
07C AD-786 095/0GA
07D AD-786 096/8GA
11B AD-786 097/6GA
07D AD-786 098/4GA
07C AD-786 099/2GA
12A AD-786 100/8GA
20M AD-786 101/6GA
20L AD-786 102/4GA
05A AD-786 103/2GA
07D AD-786 104/0GA
07E AD-786 105/7GA
07D AD-786 106/5GA
04B AD-786 107/3GA
08G AD-786 108/1GA
04B AD-786 109/9GA
20I AD-786 110/7GA
21B AD-786 111/5GA
11B AD-786 112/3GA
07D AD-786 113/1GA
07C AD-786 114/9GA
12A AD-786 115/6GA
20F AD-786 116/4GA
07D AD-786 117/2GA
01C AD-786 118/0GA
09D AD-786 119/8GA
07D AD-786 120/6GA
22B AD-786 121/4GA
01C AD-786 122/2GA
06S AD-786 123/0GA
06C AD-786 124/8GA
05B AD-786 125/5GA
08L AD-786 126/3GA
08L AD-786 127/1GA
04B AD-786 128/9GA
17B AD-786 129/7GA
12A AD-786 130/5GA
07E AD-786 131/3GA
14B AD-786 132/1GA
09B AD-786 133/9GA
09B AD-786 134/7GA
09B AD-786 135/4GA
08J AD-786 136/2GA
04B AD-786 137/0GA
07D AD-786 138/8GA
03B AD-786 139/6GA
03B AD-786 140/4GA
07D AD-786 141/2GA
06C AD-786 142/0GA
11D AD-786 143/8GA
08H AD-786 144/6GA
06M AD-786 145/3GA
01B AD-786 146/1GA
04B AD-786 147/9GA
04B AD-786 148/7GA
04B AD-786 149/5GA
20L AD-786 150/3GA
20M AD-786 151/1GA
07E AD-786 152/9GA
07D AD-786 153/7GA
08C AD-786 154/5GA
17B AD-786 155/2GA
09C AD-786 156/0GA
03A AD-786 157/8GA
05K AD-786 158/6GA
06T AD-786 159/4GA
06E AD-786 160/2GA
06E AD-786 161/0GA
06C AD-786 162/8GA
06C AD-786 163/6GA
06E AD-786 164/4GA
06E AD-786 165/1GA
06E AD-786 166/9GA
06E AD-786 167/7GA
06E AD-786 168/5GA
06E AD-786 169/3GA
06E AD-786 170/1GA
06N AD-786 171/9GA
09B AD-786 172/7GA
19D AD-786 173/5GA
07D AD-786 174/3GA
15C AD-786 175/0GA
09B AD-786 176/8GA
11F AD-786 177/6GA
02F AD-786 178/4GA
07D AD-786 179/2GA
06E AD-786 180/0GA
13J AD-786 181/8GA
13J AD-786 182/6GA
13J AD-786 183/4GA
13J AD-786 184/2GA
13J AD-786 185/9GA
13J AD-786 186/7GA
13J AD-786 187/5GA
13J AD-786 188/3GA
05C AD-786 189/1GA
12B AD-786 190/9GA
05C AD-786 191/7GA
11D AD-786 192/5GA
20L AD-786 193/3GA
20D AD-786 194/1GA
12B AD-786 195/8GA
12B AD-786 196/6GA
20L AD-786 197/4GA
01C AD-786 198/2GA
07D AD-786 199/0GA
07C AD-786 200/6GA
07D AD-786 201/4GA
05I AD-786 202/2GA
05I AD-786 203/0GA
05I AD-786 204/8GA
05I AD-786 205/5GA
05I AD-786 206/3GA
17G AD-786 207/1GA
04B AD-786 208/9GA
04B AD-786 209/7GA
04B AD-786 210/5GA
13H AD-786 211/3GA
07D AD-786 212/1GA
11F AD-786 213/9GA
13H AD-786 214/7GA
15E AD-786 215/4GA
21B AD-786 216/2GA
05A AD-786 217/0GA
05A AD-786 218/8GA
07D AD-786 219/6GA
12B AD-786 220/4GA
01A AD-786 221/2GA
01A AD-786 222/0GA
20D AD-786 223/8GA
09B AD-786 224/6GA
09B AD-786 225/3GA
12A AD-786 226/1GA
12A AD-786 227/9GA
12A AD-786 228/7GA
11F AD-786 229/5GA
14D AD-786 230/3GA
11B AD-786 231/1GA
20E AD-786 232/9GA
07A AD-786 233/7GA
09E AD-786 234/5GA
11H AD-786 235/2GA
07C AD-786 236/0GA
08C AD-786 237/8GA
17J AD-786 238/6GA
17A AD-786 239/4GA
09C AD-786 240/2GA
13C AD-786 241/0GA
04A AD-786 242/8GA
06A AD-786 243/6GA
07D AD-786 244/4GA
11F AD-786 245/1GA
11F AD-786 246/9GA
11F AD-786 247/7GA
20L AD-786 248/5GA
06L AD-786 249/3GA
06L AD-786 250/1GA
20B AD-786 251/9GA
19A AD-786 252/7GA
06L AD-786 253/5GA
20B AD-786 254/3GA
06P AD-786 255/0GA
20D AD-786 256/8GA
20L AD-786 257/6GA
20L AD-786 258/4GA
07C AD-786 259/2GA
20L AD-786 260/0GA
06S AD-786 261/8GA
06E AD-786 262/6GA
06S AD-786 263/4GA
07C AD-786 264/2GA
03B AD-786 265/9GA
07D AD-786 266/7GA
07D AD-786 267/5GA
07C AD-786 268/3GA
06O AD-786 269/1GA
13F AD-786 270/9GA
11C AD-786 271/7GA
17G AD-786 272/5GA
17I AD-786 273/3GA
12A AD-786 274/1GA
07E AD-786 275/8GA
20I AD-786 276/6GA
07D AD-786 277/4GA
11B AD-786 278/2GA
09A AD-786 279/0GA
20L AD-786 280/8GA
20D AD-786 281/6GA
19D AD-786 282/4GA
12B AD-786 283/2GA
06A AD-786 284/0GA
15E AD-786 285/7GA
09E AD-906 687/9GA
09E AD-906 734/9GA
09E AD-907 958/3GA
09E AD-909 622/3GA
17B AD-912 656/6GA
03B AD-915 362/8GA
17I AD-915 411/3GA
20N AD-915 474/1GA
17B AD-915 852/8GA
09B AEC/SNS-3060-009
11F AEC-tr-7408
07A AEC-tr-7556
18I AEC-tr-7559
18A AEC-tr-7563
18I AEC-tr-7564
18N AEC-tr-7565
07D AEC-tr-7566
08H AEC-tr-7570

18E	AECL-4441
18E	AECL-4661
18B	AECL-4667
06F	AECL-4758
20H	AECL-4773
20H	AECL-4826
07D	AECL-4828
18I	AECL-4830
18I	AECL-4831
07E	AERE-R-4987
18B	AERE-R-6758
18D	AERE-R-7250
07D	AERE-R-7345
11F	AERE-R-7734
18B	AI-65-144
18N	ALO-2832-46
13M	ANL/ES-40(Vol.9)
20H	ANL/HEP-7427
20H	ANL/HEP-7436
20G	ANL/HEP-7441
20H	ANL/NDM-6
20G	ANL-Trans-956
18E	ANL-7961
09B	ANL-8103
18N	ANSP-M-1
18N	ANSP-M-2
18N	ANSP-M-3
18N	ANSP-M-4
18N	ANSP-M-5
18N	ANSP-M-6
18N	ANSP-M-7
18N	ANSP-M-8
07D	AREAEE-183
11B	AREAEE-184
18J	ARH-SA-183
11I	ARH-SA-195
07D	BARC-696
07D	BARC-700
06L	BARC-701
08H	BARC-719
18D	BARC-752
11I	BDX-613-1033
11I	BDX-613-1110
13H	BDX-613-1123(Rev.)
11I	BDX-613-1137(Rev.)
13H	BDX-613-1158(Rev.)
11C	BDX-613-1173
11C	BDX-613-1177(Rev.)
11G	BDX-613-1178(Rev.)
11I	BDX-613-195(Rev.)
06F	BMI-171-155
20G	BNL-18891
20H	BNL-18964
18J	BNL-18969
20G	BNL-19033
20G	BNL-19042
20G	BNL-19062
20G	BNL-19080
07D	BNWL-CC-1381
07E	BNWL-SA-4830
06R	BNWL-SA-4879
06R	BNWL-SA-4925
20H	BNWL-SA-5016
18F	BNWL-SA-5026
06R	BNWL-SA-5027
04B	BNWL-SA-5031
06R	BNWL-SA-5042
06R	BNWL-SA-5049
06F	BNWL-SA-5050
04B	BNWL-1640
06F	BNWL-1828
08I	BVLI-27
07E	CALT-767P4-134
18E	CEA-N-1693
09B	CEA-N-1696
14B	CEA-N-1699
20H	CEA-N-1703
20L	CEA-R-4490
06B	CEA-R-4534
07D	CEA-R-4562
11F	CEA-R-4565
11F	CEA-R-4566
18D	CEA-R-4580
08H	CH-1459
06R	CH-3607
06R	CH-3713
13H	CLM-L-24
20I	CLM-R-129
08H	CN-1892
08H	CN-2238
06R	CN-2383
06R	CN-2546
06R	CN-2653
08H	CN-2786
08H	CN-2905
08H	CN-2992
08H	CN-3167
07C	CNAEM-R-120
05K	COM-71-80004-62/GA
05K	COM-71-80004-63/GA
05K	COM-72-70003-27/GA
05K	COM-72-70003-33/GA
05K	COM-72-70003-42R/GA
05C	COM-74-10483-27/GA
05C	COM-74-10483-54/GA
06K	COM-74-11349/9GA
06C	COM-74-11452/1GA
04B	COM-74-11470/3GA
05A	COM-74-11485/1GA
05D	COM-74-11495/0GA
13B	COM-74-11496/8GA
20F	COM-74-11525/4GA
05I	COM-74-11530/4GA
05C	COM-74-11538/7GA
05C	COM-74-11539/5GA
06O	COM-74-11540/3GA
06C	COM-74-11541/1GA
06O	COM-74-11542/9GA
08C	COM-74-11543/7GA
06C	COM-74-11545/2GA
06C	COM-74-11546/0GA
08C	COM-74-11547/8GA
08J	COM-74-11548/6GA
05C	COM-74-11552/8GA
04B	COM-74-11554/4GA
04B	COM-74-11555/1GA
08C	COM-74-11558/5GA
06C	COM-74-11564/3GA
05I	COM-74-11571/8GA
09B	COM-74-11572/6GA
13F	COM-74-11573/4GA
05C	COM-74-50061-090/GA
05C	COM-74-50061-091/GA
05C	COM-74-50061-092/GA
05C	COM-74-50061-093/GA
05C	COM-74-50061-094/GA
05C	COM-74-50061-095/GA
05C	COM-74-50061-096/GA
04A	COM-74-50087-360/GA
05C	COM-74-50113-40/GA
05C	COM-74-50113-42/GA
05C	COM-74-50113-43/GA
03B	COM-74-50190-358-1/GA
03B	COM-74-50190-358-2/GA
03B	COM-74-50190-359-1/GA
03B	COM-74-50190-359-2/GA
06C	COM-74-50277-07/GA
20J	COM-74-50829/2GA
14B	COM-74-50832/6GA
07D	COM-74-50833/4GA
07D	COM-74-50834/2GA
20H	COM-74-50835/9GA
12A	COM-74-50837/5GA
09B	COM-74-50838/3GA
09B	COM-74-50839/1GA
09B	COM-74-50840/9GA
05C	COM-74-50843/3GA
05C	COM-74-50844/1GA
05C	COM-74-50845/8GA
05B	COM-74-50847/4GA
06C	COM-74-50849/0GA
06C	COM-74-50849-01/GA
08A	COM-74-50849-02/GA
06C	COM-74-50849-03/GA
06C	COM-74-50849-04/GA
06C	COM-74-50849-05/GA
06C	COM-74-50849-06/GA
06C	COM-74-50849-07/GA
06C	COM-74-50849-08/GA
06C	COM-74-50849-09/GA
06C	COM-74-50849-10/GA
06C	COM-74-50849-11/GA
08A	COM-74-50849-12/GA
06C	COM-74-50849-13/GA
06C	COM-74-50849-14/GA
06C	COM-74-50849-15/GA
06C	COM-74-50849-16/GA
06C	COM-74-50849-17/GA
07D	COM-74-50851/6GA
07E	COM-74-50852/4GA
18D	COM-74-50853/2GA
18D	COM-74-50854/0GA
07D	COM-74-50855/7GA
20C	COM-74-50856/5GA
20C	COM-74-50857/3GA
07D	COM-74-50858/1GA
14B	COM-74-50861/5GA
04A	COM-74-50864/9GA
07D	COM-74-50866/4GA
13M	COM-74-50867/2GA
06A	COM-74-50868/0GA
07D	COM-74-50869/8GA
20L	COM-74-50871/4GA
07D	COM-74-50872/2GA
07D	COM-74-50873/0GA
07E	COM-74-50874/8GA
07D	COM-74-50875/5GA
07E	COM-74-50876/3GA
07E	COM-74-50877/1GA
09B	COM-74-50878/9GA
11F	COM-74-50880/5GA
07C	COM-74-50881/3GA
05C	COM-74-50882/1GA
07D	COM-74-50884/7GA
07D	COM-74-50885/4GA
09A	COM-74-50888/8GA
07E	COM-74-50889/6GA
07E	COM-74-50890/4GA
07C	COM-74-50891/2GA
06A	COM-74-50892/0GA
20L	COM-74-50894/6GA
11B	COM-74-50900/1GA
11D	COM-74-50902/7GA
11B	COM-74-50903/5GA
20I	COM-74-50908/4GA
20H	COM-74-50910/0GA
20F	COM-74-50914/2GA
05I	COM-74-50917/5GA
09B	COM-74-50925/8GA
09B	COM-74-50926/6GA
05K	COM-74-50929/0GA
05B	COM-74-50930/8GA
09B	COM-74-50931/6GA
06L	COM-74-50932/4GA
17G	COM-74-50934/0GA
08C	COM-74-50935/7GA
06K	COM-74-50936/5GA
06C	COM-74-50938/1GA
06C	COM-74-50939/9GA
06C	COM-74-50940/7GA
06C	COM-74-50941/5GA
05K	COM-74-70001-92/GA
05K	COM-74-70001-93/GA
05K	COM-74-70001-95/GA
05K	COM-74-70002-1507/GA
05K	COM-74-70002-1508/GA
05K	COM-74-70004-258/GA
05K	COM-74-70004-259/GA
05K	COM-74-70004-261/GA
05K	COM-74-70004-262/GA
05K	COM-74-70004-264/GA
05K	COM-74-70004-266/GA
05K	COM-74-70004-268/GA
05K	COM-74-70006-511/GA
05K	COM-74-70006-515/GA
05K	COM-74-70006-517/GA
05K	COM-74-70006-518/GA
05K	COM-74-70006-519/GA
05K	COM-74-70006-520/GA
05K	COM-74-70006-521/GA
05K	COM-74-70079-64/GA
05K	COM-74-70079-65/GA
05K	COM-74-70079-66/GA
05K	COM-74-70079-67/GA
05K	COM-74-70079-68/GA
05K	COM-74-70079-69/GA
05K	COM-74-70079-70/GA
05K	COM-74-70079-71/GA
05K	COM-74-70079-72/GA
05K	COM-74-70079-73/GA
05K	COM-74-70079-74/GA
05K	COM-74-70079-75/GA
05K	COM-74-70079-76/GA
05K	COM-74-70079-77/GA
05K	COM-74-70079-78/GA
05K	COM-74-70079-79/GA
05K	COM-74-70079-80/GA
05C	COM-74-70088/1GA
05C	COM-74-70089/9GA
05K	COM-74-70092-81/GA
05K	COM-74-70092-82/GA
13B	CONF-730802
03B	CONF-730804-P5
08H	CONF-731117-8
20H	CONF-731146-2
13L	CONF-740311-5
07C	CONF-740314-3
18E	CONF-740406-21
18E	CONF-740609-4
18I	CONF-740609-5
07A	CONF-740614-4
20H	CONF-740707-1
06E	CONF-740708-10
06E	CONF-740708-11
06E	CONF-740708-12
06E	CONF-740708-13
06E	CONF-740708-14
06E	CONF-740708-15
06E	CONF-740708-17
06E	CONF-740708-18
06E	CONF-740708-19
06E	CONF-740708-2
06E	CONF-740708-24
06E	CONF-740708-25
06E	CONF-740708-26
06A	CONF-740708-27
06E	CONF-740708-28
06E	CONF-740708-29
06E	CONF-740708-3
06E	CONF-740708-30
06E	CONF-740708-31
06E	CONF-740708-32
06E	CONF-740708-33
06E	CONF-740708-35
06E	CONF-740708-36
06O	CONF-740708-37
06E	CONF-740708-38
06E	CONF-740708-40
06E	CONF-740708-42
06E	CONF-740708-44
06E	CONF-740708-45
06E	CONF-740708-47
06E	CONF-740708-49
06E	CONF-740708-5
06E	CONF-740708-53
06E	CONF-740708-54
06E	CONF-740708-55
06R	CONF-740708-56
06O	CONF-740708-58
06E	CONF-740708-59
06E	CONF-740708-6
06E	CONF-740708-60
06E	CONF-740708-62
06E	CONF-740708-63
06E	CONF-740708-64
06E	CONF-740708-7
06E	CONF-740708-9
18K	CONF-740710-3
06R	CONF-740715-3
06R	CONF-740715-6
18F	CONF-740901-3
18F	CONF-740901-4
18F	CONF-740901-5
18F	CONF-740901-6
20H	COO-1112-201
20H	COO-1112-217
08H	COO-1156-68
07E	COO-1170-197
11F	COO-1198-1070
11F	COO-1198-1073
11F	COO-1198-1077
11F	COO-1198-1081
20H	COO-1545-141
20G	COO-1760-7
18A	COO-2007-38
20E	COO-2007-47
20H	COO-2009-67
20H	COO-2009-76
07C	COO-2026-12
20H	COO-2167-3
04B	COO-2195-11
18A	COO-2218-13
18A	COO-2218-18
20H	COO-2232A-5
18E	COO-2250-9
11F	COO-2313-1
09B	COO-2383-0010
09B	COO-2383-0011
07E	COO-3117-3
07E	COO-3117-4
06R	COO-3167-106
07E	COO-3326-28
20I	COO-3421-9
11F	COO-3429-22
07C	COO-3435-16
20H	COO-3496-44
20H	COO-535-692
20H	DEMO-74/6

20J DESY-74/15
20H DESY-74/17
20H DESY-74/18
20H DESY-74/20
20H DESY-74/22
18E DOCKET-STN-50483-9
18E DOCKET-STN-50485-11
18E DOCKET-50281-213
18J DOCKET-50332-40
18J DOCKET-50332-41
18J DOCKET-50332-42
18J DOCKET-50332-43
18J DOCKET-50332-44
18J DOCKET-50332-45
18J DOCKET-50332-46
18E DOCKET-50500-1
18E DOCKET-50514-1
11F DP-MS-73-71
07E DP-MS-74-4
18F DP-MS-74-44
11F DP(NASA)-1253
18G DPSPU-54-11-12
18J DPST-74-128-5
18N DPST-74-128-6
08K DUN-1409
08F DUN-1410
20I EUR-CEA-FC-691
20I EUR-CEA-FC-715
20I EUR-CEA-FC-718
18A EUR-CEA-FC-725
18I EUR-5039
18J EUR-5066
20M EUR-5077
18E EUR-5080e
13M EUR-5137f
18E EUR-5141
11B EURFNR-1180
08B E74-10687
08B E74-10734
08F E74-10745
13B E74-10746
08C E74-10747
08F E74-10755
08F E74-10760
20I FEI-406
20H FEI-427
18K FEI-444
11F FOA-4-C-4547-A2
06R FRNC-TH-469
18D FRNC-TH-474
20H FRNC-TH-479
11F FRNC-TH-493
07D FRNC-TH-494
18E FRNC-TH-497
11C GEPP-126
11B GEPP-131
13D GEPP-132
18D HASL-285
09B HMI-B-147
07E HMI-B-148
20H IAE-2286
20H IAE-2300
20L IAE-2307
07C IAE-2313
07D IEA-304
18D IEA-322
10B IESD-3112-1
10B IESD-3112-2
10B IESD-3112-3
10B IESD-3112-4
14B IFTJ-46/1
20H IFTJ-47/PS
07B IFTJ-50/PS
05B IJS-P-284
20H IKF-32
20H INDC(CCP)-41/U
20H INDC(SEC)-39/U
20J INFN/AE-73/7
20H IPNO-T-74-04
20H IPNO-T-74-3
20I IPP-III-12
07D IPP-III-13
20I IPP-IV-71
20I IPP-IV-72
18A IPP-4/114
20I IPP-6/124
18I IRS-F-18
07D IS-M-20
07D IS-M-21
20H IS-T-622
07D IS-T-630
11F IS-T-634
09B IS-T-637
09B IS-T-641
07C IS-T-642
20H IS-T-645
07D IS-T-646
12A IS-T-648
11F IS-T-649
07C IS-3222
05B IS-3387
05B IS-3388
05B IS-3390
11F IS-3405
20H ITEF-47
20H ITEF-72
11F ITF-73-169P
20H ITF-73-176P
20H ITF-74-11P
20L ITF-74-12P
20H ITF-74-13P
20H ITF-74-14P
20H ITF-74-19P
20J ITF-74-20E
20L ITF-74-22P
20L ITF-74-27P
20L ITF-74-28P
07D ITF-74-29P
20H ITF-74-30E
20J ITF-74-31P
20J ITF-74-33P
20J ITF-74-34E
20J ITF-74-38P
20J ITF-74-39P
20B ITF-74-4P
20H ITF-74-43P
20H ITF-74-44P
07D ITF-74-45P
20H ITF-74-46E
20C ITF-74-49E
20H ITF-74-52E
20H ITF-74-53P
20J ITF-74-54E
20H ITF-74-56P
20C ITF-74-65P
20L ITF-74-67P
12A ITF-74-8P
20C ITF-74-9E
20J ITP-74-26E
07D ITP-74-3E
20H ITP-74-51E
07D JuL-Bibl.-18
18E JAERI-M-5518
07E JAERI-M-5524
20H JAERI-M-5536
20H JAERI-M-5552
20H JAERI-M-5558
18B JAERI-M-5568
09B JAERI-M-5572
07E JAERI-M-5577
07E JAERI-M-5593
18J JAERI-M-5628
11F JAERI-M-5651
07E JAERI-1233
20H JINR-D7-8099
20H JINR-E1-7923
20H JINR-E1-8046
20H JINR-E1-8047
20H JINR-E1-8054
20H JINR-E1-8061
20H JINR-E2-7982
20H JINR-E2-8009
20L JINR-E4-7746
20H JINR-E4-7959
20L JINR-E4-7981
20H JINR-E4-7993
20H JINR-P1-7962
20H JINR-P1-7969
20H JINR-P1-8036
07E JINR-P12-7758
07D JINR-P12-7927
20G JINR-P16-7958
20H JINR-P2-7866
20J JINR-P2-7972
20H JINR-P2-7989
20J JINR-P2-7995
20H JINR-P3-7980
11F JINR-P4-7917
20H JINR-P4-8013
20B JINR-P4-8017
20H JINR-P6-7897
20H JINR-P6-8000
20C JINR-P8-7663
20I JINR-P9-7970
05J JPRS-L/5022-2
17B JPRS-62078
06R JPRS-62462
17B JPRS-62686
17B JPRS-62704
13B JPRS-62812
13B JPRS-62838
05J JPRS-62919
17B JPRS-62920
11F JPRS-62925
11F JUL-1045-FF
07D JUL-1046-CT
11B JUL-1052-RW
20B JUL-1057-ZE
18E JUL-1059-RG
12B JUL-1064-MA
18E JUL-1070-RG
20I JUL-1074-RG
12A KAPL-M-7339
08H KFK-EXT-23/74-1
20L KFK-EXT-3/74-5
18E KFK-EXT-6/73-4
11B KFK-EXT-6/74-2
14B KFK-EXT-6/74-3
18J KFK-EXT-9/74-1
09B KFK-PDV-17
09B KFK-PDV-19
09B KFK-PDV-20
09B KFK-PDV-21
09B KFK-PDV-22
09B KFK-PDV-23
09B KFK-PDV-24
18G KFK-1862
08H KFK-1899
18J KFK-1945
18J KFK-1952
18J KFK-1953
08I KFK-1957
09B KFK-1972
18H KFKI-74-15
07D KFKI-74-16
20H KFKI-74-18
18J KFKI-74-23
20H KFKI-74-24
07C KFKI-74-25
20H KFKI-74-31
18E KFKI-74-32
12A KFKI-74-41
11F KR-149
18F KY-G-262
18F KY-G-263
20F LA-UR-74-1053
18J LA-UR-74-794
07D LA-UR-74-931
13H LA-UR-74-937
07E LA-UR-74-954
18F LA-4686-MS(Suppl.)
20H LA-4855
18N LA-5506-PR
20D LA-5547-MS
20H LA-5563
07D LA-5568
08H LA-5586
18F LA-5589-MS
20K LA-5599-MS
08H LA-5602-MS
18A LA-5604-MS
08F LA-5608-MS
14B LA-5612-PR
09B LA-5613-MS
18C LA-5615-MS
20E LA-5619-MS
20K LA-5621-MS
18N LA-5622-MS
18B LA-5630-MS
10C LA-5631-MS
18A LA-5635-MS
08H LA-5636-MS
07C LA-5638-MS
18A LA-5640-MS
18A LA-5641-MS
20H LA-5644-MS
18G LA-5645
18D LA-5648-MS
18J LA-5652-M
07D LA-5653-MS
20G LAL-RI-74-3
20C LBL-1844
14B LBL-2299
20H LBL-2366
07C LBL-2383
20I LBL-2470
20G LBL-2488
20G LBL-2490
06E LBL-2491
07B LBL-2580
20C LBL-2597
07D LBL-2693
20H LBL-2908
20H LBL-2938
20H LBL-2940
20H LBL-3002
20H LBL-3014
20G LBL-3016
20H LBL-3022
20H LBL-3030
20G LBL-3032
08N LFEN-NL-79(a)
18J LFEN-152(B)
07D LFEN-155(a)
08H LFEN-158(B)
20G LNF-74/16(P)
20G LNF-74/17(P)
20G LNF-74/18(P)
20G LNF-74/19(P)
20G LNF-74/22(P)
20I LRP-80/74
20I LRP-82/74
20H LUNP-7310
09E MLM-2045
19A MLM-2114
13I MLM-2124
07E MLM-2153
18N MLM-2166
07D N-1536pm
06R N-2024
08H N-2200
08H N-2224
08H N-2261
06R N-2273
06R N-2302
13I NASA-SP-5910(05)
13L NASA-SP-5928(02)
09B NASA-SP-5956(01)
20M NASA-SP-5959(01)
06R NERC-LV-539-33
18F NLCO-1107
18A NP-20040
20G NP-20044
20D NP-20071
07D NRPB-R-17
18D NRPB-R-18
01A N74-29367/1GA
01A N74-29368/9GA
21E N74-29369/7GA
01A N74-29370/5GA
01C N74-29374/7GA
01C N74-29375/4GA
01A N74-29376/2GA
01C N74-29377/0GA
20A N74-29378/8GA
20A N74-29379/6GA
01B N74-29382/0GA
20A N74-29383/8GA
20A N74-29384/6GA
20A N74-29385/3GA
10A N74-29411/7GA
10C N74-29412/5GA
10B N74-29413/3GA
10C N74-29414/1GA
10C N74-29415/8GA
10B N74-29417/4GA
06E N74-29441/4GA
06E N74-29442/2GA
06E N74-29443/0GA
02D N74-29445/5GA
06M N74-29446/3GA
06S N74-29447/1GA
06S N74-29448/9GA
05H N74-29459/6GA
05E N74-29460/4GA
06B N74-29461/2GA
06L N74-29462/0GA
06B N74-29463/8GA
05J N74-29464/6GA
07C N74-29473/7GA
07D N74-29474/5GA
08G N74-29475/2GA
07C N74-29476/0GA
07C N74-29477/8GA
07D N74-29478/6GA
21I N74-29481/0GA
17B N74-29494/3GA
20N N74-29495/0GA

09D N74-29496/8GA
17B N74-29497/6GA
09E N74-29498/4GA
17B N74-29499/2GA
17G N74-29500/7GA
12A N74-29509/8GA
13G N74-29527/0GA
09B N74-29528/8GA
09B N74-29529/6GA
05A N74-29530/4GA
05A N74-29531/2GA
09B N74-29532/0GA
09B N74-29533/8GA
09B N74-29534/6GA
09B N74-29535/3GA
09B N74-29536/1GA
09B N74-29537/9GA
09B N74-29538/7GA
09B N74-29539/5GA
09B N74-29540/3GA
12B N74-29541/1GA
09B N74-29542/9GA
09B N74-29543/7GA
08F N74-29544/5GA
09B N74-29545/2GA
09A N74-29557/7GA
09A N74-29558/5GA
09E N74-29559/3GA
09E N74-29560/1GA
09C N74-29561/9GA
09E N74-29562/7GA
09A N74-29563/5GA
10B N74-29564/3GA
09A N74-29565/0GA
09E N74-29566/8GA
09C N74-29567/6GA
09C N74-29568/4GA
09E N74-29569/2GA
09E N74-29570/0GA
09C N74-29571/8GA
09E N74-29572/6GA
09E N74-29574/2GA
09A N74-29576/7GA
09A N74-29578/3GA
09E N74-29579/1GA
09E N74-29597/3GA
07D N74-29598/1GA
09E N74-29599/9GA
12A N74-29600/5GA
09E N74-29601/3GA
12A N74-29602/1GA
09A N74-29603/9GA
14B N74-29604/7GA
05E N74-29610/4GA
05A N74-29611/2GA
14B N74-29612/0GA
11H N74-29636/9GA
20I N74-29637/7GA
21B N74-29638/5GA
13I N74-29639/3GA
20D N74-29640/1GA
20D N74-29641/9GA
20D N74-29642/7GA
20D N74-29643/5GA
20D N74-29644/3GA
20D N74-29645/0GA
20D N74-29646/8GA
20D N74-29647/6GA
20D N74-29648/4GA
20D N74-29649/2GA
20D N74-29650/0GA
20D N74-29651/8GA
20D N74-29653/4GA
20D N74-29654/2GA
20D N74-29655/9GA
21E N74-29656/7GA
04A N74-29703/7GA
04A N74-29704/5GA
08C N74-29706/0GA
04A N74-29707/8GA
08C N74-29708/6GA
08N N74-29709/4GA
04A N74-29710/2GA
08F N74-29711/0GA
08H N74-29712/8GA
04A N74-29714/4GA
04A N74-29715/1GA
04A N74-29716/9GA
04A N74-29717/7GA
08N N74-29718/5GA
04A N74-29719/3GA
08N N74-29720/1GA

08N N74-29721/9GA
08N N74-29722/7GA
08L N74-29723/5GA
08A N74-29724/3GA
14E N74-29725/0GA
08B N74-29726/8GA
22B N74-29727/6GA
08B N74-29728/4GA
04A N74-29729/2GA
08E N74-29732/6GA
08B N74-29733/4GA
04A N74-29735/9GA
14B N74-29768/0GA
14B N74-29769/8GA
17B N74-29771/4GA
13I N74-29774/8GA
14B N74-29775/5GA
14B N74-29776/3GA
11D N74-29784/7GA
14B N74-29785/4GA
14D N74-29876/1GA
11H N74-29877/9GA
13H N74-29878/7GA
11H N74-29879/5GA
13I N74-29880/3GA
13E N74-29881/1GA
13H N74-29882/9GA
13K N74-29883/7GA
13I N74-29884/5GA
22A N74-29885/2GA
22A N74-29905/8GA
20D N74-29928/0GA
11H N74-29929/8GA
13H N74-29930/6GA
13I N74-29931/4GA
13I N74-29932/2GA
13I N74-29933/0GA
13H N74-29934/8GA
04A N74-29951/2GA
20E N74-29952/0GA
20E N74-29953/8GA
11F N74-29972/8GA
07D N74-29973/6GA
13H N74-29974/4GA
11F N74-29975/1GA
11F N74-29976/9GA
13H N74-29977/7GA
09A N74-29978/5GA
11F N74-29979/3GA
22B N74-29980/1GA
11F N74-29981/9GA
11D N74-29982/7GA
11F N74-29983/5GA
11D N74-30002/1GA
07D N74-30003/9GA
11C N74-30006/2GA
20M N74-30008/8GA
12A N74-30021/1GA
12A N74-30023/7GA
09B N74-30024/5GA
09B N74-30025/2GA
12A N74-30026/0GA
12A N74-30027/8GA
20J N74-30028/6GA
04B N74-30047/6GA
14B N74-30049/2GA
20D N74-30050/0GA
04B N74-30052/6GA
04B N74-30053/4GA
04B N74-30054/2GA
02D N74-30055/9GA
22C N74-30091/4GA
22C N74-30092/2GA
17G N74-30093/0GA
17G N74-30094/8GA
17G N74-30095/5GA
17G N74-30096/3GA
20F N74-30109/4GA
20M N74-30110/2GA
20L N74-30111/0GA
20M N74-30112/8GA
20C N74-30113/6GA
20F N74-30114/4GA
20I N74-30115/1GA
20F N74-30116/9GA
20J N74-30117/7GA
20F N74-30119/3GA
20A N74-30120/1GA
20F N74-30121/9GA
20L N74-30137/5GA
20H N74-30138/3GA
20H N74-30139/1GA

20H N74-30140/9GA
20H N74-30141/7GA
20H N74-30142/5GA
20J N74-30143/3GA
20H N74-30144/1GA
10B N74-30157/3GA
10B N74-30158/1GA
20I N74-30159/9GA
20I N74-30160/7GA
04A N74-30161/5GA
04A N74-30162/3GA
20L N74-30194/6GA
20L N74-30195/3GA
20L N74-30196/1GA
20L N74-30197/9GA
20L N74-30198/7GA
20C N74-30199/5GA
20M N74-30201/9GA
09A N74-30202/7GA
20L N74-30203/5GA
20B N74-30204/3GA
09A N74-30205/0GA
20L N74-30206/8GA
20C N74-30207/6GA
09A N74-30208/4GA
20L N74-30210/0GA
20B N74-30211/8GA
21I N74-30233/2GA
21B N74-30234/0GA
21B N74-30235/7GA
21E N74-30238/1GA
21E N74-30239/9GA
21E N74-30240/7GA
21E N74-30241/5GA
21E N74-30242/3GA
21E N74-30243/1GA
21E N74-30244/9GA
21E N74-30245/6GA
21E N74-30246/4GA
21C N74-30247/2GA
21H N74-30248/0GA
21E N74-30249/8GA
21E N74-30250/6GA
03B N74-30257/1GA
03B N74-30258/9GA
03B N74-30259/7GA
04A N74-30260/5GA
05H N74-30274/6GA
03B N74-30275/3GA
03A N74-30276/1GA
22A N74-30277/9GA
04A N74-30278/7GA
22A N74-30280/3GA
03B N74-30281/1GA
03B N74-30282/9GA
22C N74-30284/5GA
22C N74-30285/2GA
04A N74-30286/0GA
03B N74-30287/8GA
03B N74-30288/6GA
03B N74-30289/4GA
22A N74-30290/2GA
03B N74-30291/0GA
03B N74-30292/8GA
03A N74-30293/6GA
22A N74-30300/9GA
19G N74-30301/7GA
17G N74-30302/5GA
22A N74-30303/3GA
17G N74-30304/1GA
22A N74-30305/8GA
22B N74-30306/6GA
22B N74-30307/4GA
22B N74-30308/2GA
22B N74-30309/0GA
22B N74-30310/8GA
06S N74-30312/4GA
04B N74-30313/2GA
22C N74-30314/0GA
22B N74-30315/7GA
11F N74-30326/4GA
11F N74-30327/2GA
20K N74-30328/0GA
20K N74-30329/8GA
20K N74-30330/6GA
20K N74-30331/4GA
20K N74-30332/2GA
21E N74-30333/0GA
22B N74-30334/8GA
11F N74-30335/5GA
20K N74-30336/3GA
20K N74-30337/1GA

18J N74-30338/9GA
20K N74-30339/7GA
21B N74-30364/5GA
20M N74-30365/2GA
21I N74-30366/0GA
20M N74-30367/8GA
20D N74-30368/6GA
20M N74-30369/4GA
10A N74-30378/5GA
05A N74-30379/3GA
19F N74-30381/9GA
13L N74-30390/0GA
05A N74-30392/6GA
01A N74-30415/5GA
01A N74-30416/3GA
20D N74-30417/1GA
01A N74-30418/9GA
20M N74-30422/1GA
20A N74-30423/9GA
01B N74-30424/7GA
01A N74-30425/4GA
01A N74-30426/2GA
01C N74-30427/0GA
20A N74-30428/8GA
01D N74-30429/6GA
01B N74-30431/2GA
01A N74-30432/0GA
01C N74-30433/8GA
01C N74-30434/6GA
20K N74-30436/1GA
10B N74-30445/2GA
09A N74-30449/4GA
06E N74-30458/5GA
06P N74-30461/9GA
06P N74-30462/7GA
06F N74-30463/5GA
06F N74-30464/3GA
06A N74-30465/0GA
06E N74-30466/8GA
06C N74-30467/6GA
06P N74-30468/4GA
06P N74-30469/2GA
06S N74-30470/0GA
06S N74-30471/8GA
06P N74-30472/6GA
06O N74-30473/4GA
06A N74-30474/2GA
06B N74-30476/7GA
06M N74-30477/5GA
06M N74-30479/1GA
06M N74-30480/9GA
06F N74-30481/7GA
06S N74-30482/5GA
05H N74-30488/2GA
06S N74-30489/0GA
06H N74-30490/8GA
06B N74-30491/6GA
06H N74-30492/4GA
06H N74-30493/2GA
06H N74-30494/0GA
06H N74-30495/7GA
06K N74-30496/5GA
06K N74-30497/3GA
06K N74-30498/1GA
06H N74-30499/9GA
06H N74-30500/4GA
07D N74-30503/8GA
07D N74-30504/6GA
07D N74-30505/3GA
07D N74-30506/1GA
07D N74-30508/7GA
17B N74-30533/5GA
17B N74-30534/3GA
22B N74-30536/8GA
09B N74-30547/5GA
12B N74-30550/9GA
09B N74-30551/7GA
09B N74-30552/5GA
09B N74-30553/3GA
09B N74-30554/1GA
06K N74-30567/3GA
09A N74-30568/1GA
09E N74-30569/9GA
09E N74-30570/7GA
09A N74-30571/5GA
09A N74-30572/3GA
09E N74-30573/1GA
10B N74-30574/9GA
09E N74-30575/6GA
09E N74-30593/9GA
04B N74-30598/8GA
14B N74-30599/6GA

22A N74-30600/2GA
20D N74-30621/8GA
20D N74-30622/6GA
01A N74-30623/4GA
20D N74-30624/2GA
20D N74-30625/9GA
20D N74-30626/7GA
20D N74-30628/3GA
20D N74-30629/1GA
20D N74-30630/9GA
20D N74-30631/7GA
20N N74-30694/5GA
08F N74-30699/4GA
08N N74-30702/6GA
08E N74-30704/2GA
05B N74-30705/9GA
05B N74-30774/5GA
08E N74-30831/3GA
08G N74-30832/1GA
08H N74-30833/9GA
06F N74-30834/7GA
08F N74-30835/4GA
08C N74-30836/2GA
08J N74-30838/8GA
08J N74-30839/6GA
04A N74-30840/4GA
04A N74-30841/2GA
08C N74-30842/0GA
22A N74-30843/8GA
03B N74-30891/7GA
08N N74-30892/5GA
14B N74-30893/3GA
14B N74-30895/8GA
14B N74-30896/6GA
14B N74-30897/4GA
03A N74-30898/2GA
22B N74-30899/0GA
22B N74-30900/6GA
13K N74-30921/2GA
13E N74-30922/0GA
13I N74-30958/4GA
13H N74-30959/2GA
11B N74-30960/0GA
13I N74-30961/8GA
13I N74-30962/6GA
13H N74-30963/4GA
13I N74-30964/2GA
11F N74-30987/3GA
11F N74-30991/5GA
11F N74-30992/3GA
11F N74-30993/1GA
11F N74-30995/6GA
13H N74-30996/4GA
11F N74-30997/2GA
11F N74-30998/0GA
11F N74-30999/8GA
11F N74-31000/4GA
11F N74-31001/2GA
11F N74-31003/8GA
11F N74-31004/6GA
11F N74-31005/3GA
13H N74-31006/1GA
07D N74-31023/6GA
11B N74-31024/4GA
11D N74-31025/1GA
12A N74-31036/8GA
12A N74-31037/6GA
20D N74-31038/4GA
12A N74-31039/2GA
12A N74-31040/0GA
12A N74-31041/8GA
21I N74-31042/6GA
04B N74-31081/4GA
04B N74-31084/8GA
04B N74-31094/7GA
04A N74-31115/0GA
17G N74-31137/4GA
20C N74-31152/3GA
20F N74-31153/1GA
17G N74-31154/9GA
21H N74-31206/7GA
07D N74-31230/7GA
20L N74-31249/7GA
20L N74-31250/5GA
20L N74-31251/3GA
09A N74-31252/1GA
20L N74-31253/9GA
21I N74-31266/1GA
21E N74-31272/9GA
07D N74-31273/7GA
21E N74-31274/5GA
21H N74-31276/0GA
21H N74-31277/8GA
03B N74-31283/6GA
03B N74-31284/4GA
03B N74-31285/1GA
03B N74-31286/9GA
03B N74-31287/7GA
03A N74-31298/4GA
22C N74-31299/2GA
03B N74-31307/3GA
04B N74-31308/1GA
03A N74-31309/9GA
22C N74-31310/7GA
22C N74-31311/5GA
22C N74-31312/3GA
22C N74-31313/1GA
22C N74-31314/9GA
22C N74-31315/6GA
22C N74-31316/4GA
03B N74-31317/2GA
03B N74-31318/0GA
03B N74-31319/8GA
22C N74-31320/6GA
03A N74-31321/4GA
03A N74-31322/2GA
03A N74-31323/0GA
22B N74-31328/9GA
22B N74-31329/7GA
22B N74-31330/5GA
22B N74-31331/3GA
20D N74-31332/1GA
22B N74-31333/9GA
22B N74-31334/7GA
22B N74-31335/4GA
22B N74-31337/0GA
22B N74-31340/4GA
21I N74-31341/2GA
22A N74-31342/0GA
22B N74-31343/8GA
22B N74-31344/6GA
22A N74-31345/3GA
22D N74-31346/1GA
22D N74-31347/9GA
22B N74-31348/7GA
22C N74-31349/5GA
20C N74-31355/2GA
20K N74-31356/0GA
11F N74-31357/8GA
13F N74-31359/4GA
22B N74-31360/2GA
21H N74-31381/8GA
20M N74-31382/6GA
05A N74-31388/3GA
05B N74-31391/7GA
05A N74-31392/5GA
10A ORNL-EIS-74-52(Vol.2)(No.3)
13B ORNL-NSF-EP-72
11F ORNL-SUB-3654-1
20H ORNL-TM-3995
06J ORNL-TM-4051
11F ORNL-TM-4543
18A ORNL-TM-4575
18K ORNL-TM-4595
11F ORNL-TM-4604
11F ORNL-TM-4621
12A ORNL-TM-4625
18A ORNL-TM-4647
18F ORNL-TM-4648
12A ORNL-4957
08H ORNL-4974
18H ORO-2911-16
07C ORO-3018-118
07D ORO-3018-123
07D ORO-3861-10
06A ORO-3861-13
02D ORO-4180-4
06P ORO-4245-1
20H ORO-4317-40
13B ORO-4395-1
07C PAT-APPL-278 831
13G PAT-APPL-420 424
11K PAT-APPL-431 762
10C PAT-APPL-440 916
14B PAT-APPL-450 521
07A PAT-APPL-459 737
14B PAT-APPL-464 427
13I PAT-APPL-467 506
13M PAT-APPL-478 284
11C PAT-APPL-482 104
11C PAT-APPL-482 105
17B PAT-APPL-482 953
19F PAT-APPL-483 736
11F PAT-APPL-483 858
13E PAT-APPL-486 801
14B PAT-APPL-486 802
20E PAT-APPL-486 803
19G PAT-APPL-486 804
07C PAT-APPL-487 852
07C PAT-APPL-489 008
14B PAT-APPL-489 009
09E PAT-APPL-491 413
22B PAT-APPL-491 417
09A PAT-APPL-491 418
09E PAT-APPL-491 419
09A PAT-APPL-492 075
17B PAT-APPL-492 077
17H PAT-APPL-492 093
17G PAT-APPL-493 359
14B PAT-APPL-493 363
10B PAT-APPL-495 021
09B PAT-APPL-495 022
01C PAT-APPL-496 779
13I PATENT-3 776 284
13I PATENT-3 778 217
18J PATENT-3 782 924
11C PATENT-3 783 014
07A PATENT-3 785 120
11C PATENT-3 785 994
18D PATENT-3 786 270
18D PATENT-3 787 746
14B PATENT-3 787 764
18D PATENT-3 789 227
20E PATENT-3 789 319
20E PATENT-3 789 321
11F PATENT-3 791 945
14B PATENT-3 791 953
07A PATENT-3 792 154
07A PATENT-3 792 155
18B PATENT-3 792 156
09E PATENT-3 792 423
11G PATENT-3 793 204
07A PATENT-3 793 435
07A PATENT-3 794 116
18B PATENT-3 794 470
10B PATENT-3 794 527
11F PATENT-3 794 532
13H PATENT-3 794 814
20G PATENT-3 794 927
20E PATENT-3 794 929
14B PATENT-3 795 451
07A PATENT-3 796 545
07D PATENT-3 797 299
18J PATENT-3 798 124
20E PATENT-3 798 569
14B PATENT-3 799 029
07A PATENT-3 800 023
14B PATENT-3 800 161
11D PATENT-3 814 645
20I PATENT-3 817 622
05H PATENT-3 824 707
14B PATENT-3 825 760
01C PATENT-3 826 448
11F PATENT-3 826 726
13H PATENT-3 826 729
09E PATENT-3 826 964
20A PATENT-3 827 288
20F PATENT-3 827 807
17B PATENT-3 828 137
17B PATENT-3 828 138
14B PATENT-3 828 524
21E PATENT-3 829 237
13M PB-233 912/5GA
07A PB-234 488/5GA
13F PB-234 501/5GA
17B PB-234 506/4GA
20M PB-234 582/5GA
05I PB-234 677/3GA
10B PB-234 860/5GA
10B PB-234 861/3GA
06C PB-234 947/0GA
13C PB-234 954/6GA
06L PB-235 026/2GA
06E PB-235 027/0GA
05I PB-235 036/1GA
13B PB-235 165/8GA
05K PB-235 210/2GA
05K PB-235 211/0GA
05I PB-235 212/8GA
05K PB-235 213/6GA
05K PB-235 226/8GA
13B PB-235 227/6GA
05J PB-235 228/4GA
05K PB-235 229/2GA
05K PB-235 230/0GA
05I PB-235 231/8GA
05K PB-235 232/6GA
05C PB-235 242/5GA
06E PB-235 244/1GA
06L PB-235 246/6GA
13B PB-235 247/4GA
13B PB-235 248/2GA
06L PB-235 251/6GA
21D PB-235 254/0GA
08H PB-235 256/5GA
13B PB-235 259/9GA
08H PB-235 261/5GA
05I PB-235 276/3GA
09B PB-235 283/9GA
06L PB-235 285/4GA
09B PB-235 292/0GA
09B PB-235 294/6GA
09B PB-235 295/3GA
09B PB-235 297/9GA
05B PB-235 299/5GA
09B PB-235 304/3GA
20K PB-235 305/0GA
09B PB-235 309/2GA
13B PB-235 310/0GA
13B PB-235 311/8GA
13B PB-235 319/1GA
13B PB-235 331/6GA
13B PB-235 338/1GA
09B PB-235 339/9GA
06F PB-235 359/7GA
06E PB-235 375/3GA
06E PB-235 377/9GA
05K PB-235 379/5GA
06B PB-235 383/7GA
07B PB-235 406/6GA
06H PB-235 410/8GA
06E PB-235 414/0GA
08G PB-235 464/5GA
13A PB-235 482/7GA
10A PB-235 487/6GA
13F PB-235 492/6GA
07E PB-235 503/0GA
05J PB-235 513/9GA
05K PB-235 519/6GA
05K PB-235 520/4GA
05K PB-235 521/2GA
05J PB-235 525/3GA
12A PB-235 527/9GA
06E PB-235 543-SET/GA
06E PB-235 544/4GA
06E PB-235 545/1GA
06E PB-235 546/9GA
06E PB-235 547/7GA
06E PB-235 548/5GA
06E PB-235 549/3GA
06E PB-235 550/1GA
06E PB-235 551/9GA
06E PB-235 552/7GA
06E PB-235 553/5GA
06E PB-235 554/3GA
13B PB-235 556/8GA
09B PB-235 563/4GA
09B PB-235 564/2GA
13B PB-235 567/5GA
13B PB-235 571/7GA
05K PB-235 578/2GA
06E PB-235 579/0GA
05C PB-235 585/7GA
10B PB-235 587/3GA
13B PB-235 588/1GA
13B PB-235 592/3GA
06E PB-235 601/2GA
06C PB-235 609/5GA
08I PB-235 616/0GA
05C PB-235 648/3GA
05C PB-235 649/1GA
13F PB-235 671/5GA
08M PB-235 673/1GA
21B PB-235 674/9GA
13B PB-235 676/4GA
05K PB-235 677/2GA
13B PB-235 691/3GA
13B PB-235 701/0GA
13F PB-235 703/6GA
12A PB-235 706/9GA
13B PB-235 707/7GA
05I PB-235 710/1GA
21B PB-235 712/7GA
05I PB-235 714/3GA
13B PB-235 716/8GA
13B PB-235 717/6GA
13B PB-235 718/4GA

13B PB-235 735/8GA
13B PB-235 736/6GA
13B PB-235 751/5GA
12B PB-235 754/9GA
09B PB-235 760/6GA
11L PB-235 764/8GA
21D PB-235 767/1GA
11F PB-235 770/5GA
09B PB-235 773/9GA
09B PB-235 775/4GA
13B PB-235 783/8GA
06L PB-235 790/3GA
06L PB-235 791/1GA
06L PB-235 792/9GA
13B PB-235 796/0GA
10A PB-235 817/4GA
05K PB-235 819/0GA
06F PB-235 823/2GA
13B PB-235 824/0GA
06F PB-235 837/2GA
06M PB-235 839/8GA
07A PB-235 840/6GA
09B PB-235 843/0GA
13C PB-235 848/9GA
08I PB-235 849/7GA
05I PB-235 851/3GA
08I PB-235 854/7GA
08H PB-235 855/4GA
05B PB-235 868/7GA
05B PB-235 869/5GA
05B PB-235 870/3GA
13B PB-235 871/1GA
09B PB-235 873/7GA
09B PB-235 874/5GA
09B PB-235 875/2GA
13B PB-235 884/4GA
09B PB-235 885/1GA
09B PB-235 895/0GA
09B PB-235 896/8GA
07A PB-235 898/4GA
07A PB-235 899/2GA
07D PB-235 901/6GA
13B PB-235 903/2GA
08H PB-235 906/5GA
07A PB-235 908/1GA
02C PB-235 909/9GA
06F PB-235 910/7GA
13B PB-235 912/3GA
08H PB-235 913/1GA
05I PB-235 916/4GA
13L PB-235 917/2GA
13L PB-235 921/4GA
13B PB-235 925/5GA
05B PB-235 928/9GA
13B PB-235 929/7GA
13B PB-235 931/3GA
09B PB-235 935/4GA
05I PB-235 938/8GA
13F PB-235 942/0GA
13B PB-235 948/7GA
08M PB-235 949/5GA
05B PB-235 982/6GA
21D PB-235 983/4GA
13C PB-235 984/2GA
05B PB-235 993/3GA
13B PB-235 995/8GA
20D PB-235 998/2GA
13B PB-236 026/1GA
13M PB-236 027/9GA
13B PB-236 044/4GA
05B PB-236 046/9GA
06B PB-236 052/7GA
06L PB-236 053/5GA
13C PB-236 056/8GA
08H PB-236 066/7GA
06E PB-236 087/3GA
05D PB-236 096/4GA
08M PB-236 107/9GA
05K PB-236 118/6GA
05K PB-236 138/4GA
05K PB-236 139/2GA
05K PB-236 140/0GA
05K PB-236 141/8GA
05D PB-236 275/4GA
05I PB-236 333/1GA
05K PB-236 334/9GA
05K PB-236 335/6GA
20A PB-236 382/8GA
08H PEL-229
18C PNE-MHF-1
18H PRNC-173
08H RD/B/N-2931
08H RFP-Trans-162
11F RFP-2067
08H RFP-2164
11F RFP-2207
09B RISO-M-1720
18D RISO-M-1724
20G RL-74-052
20G RL-74-053
20G RL-74-054
20G RL-74-055
20G RL-74-058
09B RL-74-059
20G RL-74-062
20G RL-74-078
20H RL-74-079
20H RL-74-082
20G RL-74-083
20H RL-74-084
20H RL-74-41
08J RLO-2225-T-25-12
08H RLO-2227-T12-42
07D RLO-2230-T-2-14
07E RRL-3238-488
18D RT/EL-(73)5
09B RT/EL-(74)1
18E RT/ING-(74)3
18E RT/ING-(74)5
18J RT/ING-(74)6
13A RT/ING-(74)7
18E RT/ING-(74)8
06R SAN-410-173
20G SAND-74-0008
09E SAND-74-0009
15F SAND-74-0029
12A SAND-74-0057
09A SAND-74-5209
19D SAND-74-5235
22C SAND-74-56
09B SAND-74-8201
05J SC-TM-72-0617
05E SCR-685
11B SGAE-2217
18J SGAE-2260
12A SLA-73-0058
09E SLA-73-1063
13M SLA-73-1088
12A SLA-73-28-A
09A SLA-73-934
22C SLA-74-0169
09B SLA-74-0195
08M SLA-74-0201
13I SLA-74-0206
20G SLA-74-0215
08I SLA-74-0248
09E SLA-74-0300
09E SLA-74-0333
08K SLA-74-185
11B SLA-74-186
12A SLA-74-270
13H SLA-74-274
14B SLA-74-306
09A SLA-74-5030
10B SLA-74-5078
18F SLA-74-5371
18F SLA-74-5372
18F SLA-74-5373
20K SLA-74-9
07D SLL-74-0013
11F SLL-74-0208
20M SLL-74-0242
08H SR-639-14
07D SRO-525-7
06A SRO-638-8
06F SRO-819-1
06F SRO-819-2
18D SSI-1973-022
18H SZS-154
18G SZS-156
06R SZS-158
18G SZS-159
06R SZS-160
07C TID-26580
11F TID-26595
12B TID-26598
20H TID-26612
08H TID-3910(Suppl.9)
20K TRG-Report-2504(R)
13B TT-72-54022/1
05I TT-73-56029
08G TT-74-53013
09B TUBIK-28
18J TUBIK-30
07D UCB-34-P-20-160
06R UCD-34P187X2
13A UCID-15462
08G UCID-15848
20G UCID-15893
18C UCID-16161
11A UCID-16413
09B UCID-16462(Rev.1)
11F UCID-16491
14E UCID-16502
09B UCID-16507
20H UCID-16516
08G UCID-16526
18C UCID-16529
20H UCID-16531
09B UCID-16532
08H UCID-16537
08K UCID-16540
20K UCID-16541
08M UCID-16542
08M UCID-16543
19D UCID-16557
12A UCID-16558
04A UCID-16559
05A UCID-16560
18A UCID-16564
04B UCID-16565
09B UCID-30085
20M UCLA-ENG-7416
09B UCLA-10-P-14-120
06R UCLA-34-P-102-52
18B UCLA-34-P-134-10
07D UCLA-34-P-91-70
07D UCLA-34-P-91-71
12A UCLA-34P214-2
06R UCR-34P51-37
07D UCRL-13598
20H UCRL-50400(Vol.3)(Rev.1)
19D UCRL-51319
11F UCRL-51544
18C UCRL-51560
11F UCRL-51575
07D UCRL-51577 Pt.1
13B UCRL-51588
20I UCRL-51591
08F UCRL-51592
20H UCRL-51603
18J UCRL-51605
18A UCRL-51606
18A UCRL-51608
18A UCRL-51610
20E UCRL-51613
18A UCRL-74487
18A UCRL-74488
20I UCRL-74937
18A UCRL-74938
20E UCRL-74959
18B UCRL-75545(Rev.1)
07D UCRL-75567
20H UCRL-75694
07E UCRL-75696
07D UCRL-75708
20E UCRL-75752
06R UCSD-10-P-20-171
20H UJV-3080-P
20D UJV-3153-R
18E UJV-3279-R
06T UR-3055-13
06R UR-3490-444
06M UR-3490-474
14B UR-3490-478
06P UR-3490-501
06E UR-3490-509
06P UR-3490-515
06R UR-3490-533
06A UR-3490-546
06R UR-3490-583
18H USC-113P-51
06R USC-113P-53
12A USC-113P-65
18H USC-113P-69
08F USGS-474-145
08F USGS-474-174
18C USGS-474-180
20H USIP-73-11
14B WASH-1181-74
18A WASH-1295
18I WASH-1328
18F Y-DD-153
13A Y-EC-195(Rev.1)
11B Y-1933
11B Y-1946
11A Y-1952
20L ZFK-250
07E ZFK-251
07D ZFK-253
20G ZFK-255
20H ZFK-260
20H ZFK-262
18E ZJE-145
18I ZJE-148

* U. S. GOVERNMENT PRINTING OFFICE : 1974 582-818/10

MAIL ORDER TO:

NTIS

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22161

Date _____

SHIP TO: (Enter if different from address at left.)

PURCHASER:

Name _____

Address _____

City, State, Zip _____

Attention: _____

Name _____

Organization _____

Address _____

City, State, ZIP _____

(703) 321-8543 **TELEX 89-9405**

- ☐ Charge my NTIS deposit account no. _____
- ☐ Send me an application for an NTIS deposit account.
- ☐ Purchase order no. _____
- ☐ Check enclosed for $_____
- ☐ Bill me (not applicable to foreign orders) add $5 per order.
- ☐ Charge to my American Express Card account number.

☐☐☐ ☐☐☐ ☐☐☐ ☐ ☐☐☐

_____
Signature

Wherever a foreign sales price is NOT specified in the listings, all foreign buyers must add the following charges to each order.
$2.50 for each document
$1.50 for each microfiche

FOR DDC USERS ONLY
DDC USER CODE _____
CONTRACT NUMBER _____
(LAST 6 CHARACTERS ONLY)

Routing Code. NTIS can label each document for routing within your organization. If you want this service put your routing code in the box marked Routing Code.

Document Number	Routing Code	Check one		Quantity	Unit Price	Total Price
		Paper Copy	Micro fiche			
					Enter Grand Total →	$

COSATI Subject Fields

1 AERONAUTICS

2 AGRICULTURE

3 ASTRONOMY AND ASTROPHYSICS

4 ATMOSPHERIC SCIENCES

5 BEHAVIORAL AND SOCIAL SCIENCES

6 BIOLOGICAL AND MEDICAL SCIENCES

7 CHEMISTRY

8 EARTH SCIENCES AND OCEANOGRAPHY

9 ELECTRONICS AND ELECTRICAL ENGINEERING

10 ENERGY CONVERSION (NON-PROPULSIVE)

11 MATERIALS

12 MATHEMATICAL SCIENCES

13 MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

14 METHODS AND EQUIPMENT

15 MILITARY SCIENCES

16 MISSILE TECHNOLOGY

17 NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES

18 NUCLEAR SCIENCE AND TECHNOLOGY

19 ORDNANCE

20 PHYSICS

21 PROPULSION AND FUELS

22 SPACE TECHNOLOGY

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

OFFICIAL BUSINESS

PRINTED MATTER

AN EQUAL OPPORTUNITY EMPLOYER

U.S.MAIL

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM 211

GRA
SERIALS DEPT
XEROX UNIVERSITY MICROFILMS
300 NORTH ZEEB ROAD
ANN ARBOR MI 48106

X750630 001